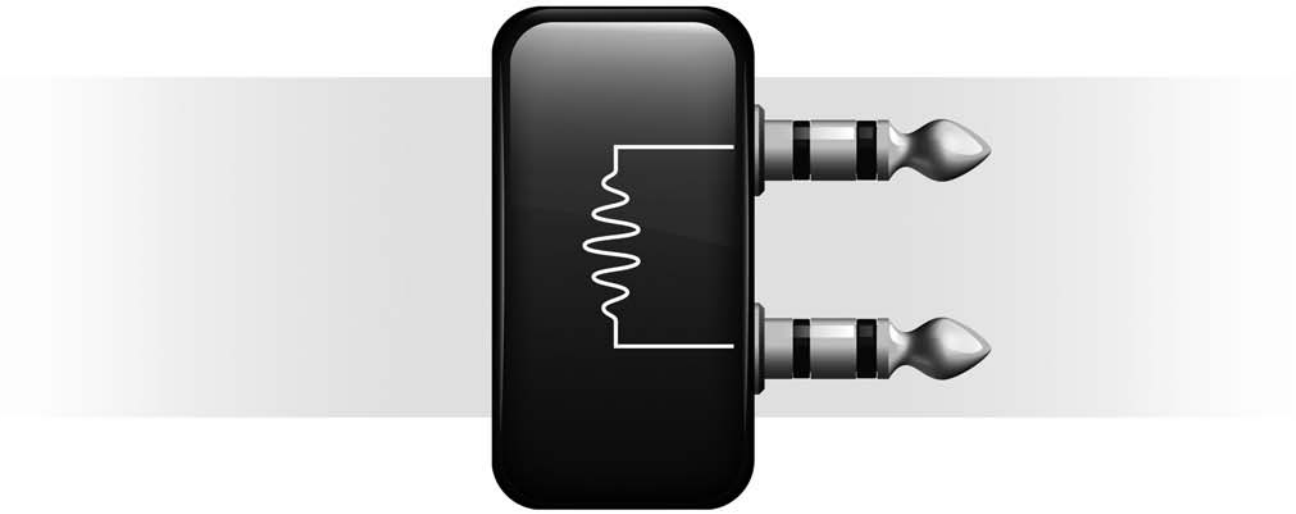

Trillium Lane Labs® Plug-ins

Version 7.3

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Product features, specifications, system requirements, and availability are subject to change without notice.

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chapter 1

Introduction

Welcome to the Trillium Lane Labs® plug-ins for Pro Tools|HD®, Pro Tools LE™, and VENUE systems (brought to you by Digidesign®), as well as Avid Xpress®, Avid Xpress DV, and Avid DNA™ systems.

⚠ *References to Pro Tools LE™ in this guide are usually interchangeable with Pro Tools M-Powered™ or Pro Tools Academic™, except as noted in the Pro Tools M-Powered and Academic Getting Started Guides.*

Digidesign Trillium Lane Labs plug-ins include the following:

- TL Aggro™
- TL AutoPan™
- TL Drum Rehab™
- TL EveryPhase™
- TL InTune™
- TL MasterMeter™
- TL Metro™
- TL Space™ TDM and TL Space Native

Contents of the Boxed Version of Your Plug-in

Your plug-in package contains the following components:

- Installation disc
- Digidesign Registration Information Card
- One of the following authorization cards for authorizing plug-ins with an iLok USB Smart Key (not supplied):
  - Activation Card with an Activation Code (for authorizing plug-ins with an iLok USB Smart Key, not supplied)

  – or –
  - License Card (for authorizing plug-ins with an iLok USB Smart Key, not supplied)

System Requirements

To use Digidesign plug-ins you need the following:

- An iLok USB Smart Key
- An iLok.com account for managing iLok licenses
- One of the following:
  - A Digidesign-qualified Pro Tools|HD system, Pro Tools LE system, or Pro Tools M-Powered system
  - A Digidesign-qualified Pro Tools system and a third-party software application that supports the Digidesign TDM, RTAS®, or AudioSuite™ plug-in standards
  - A Digidesign-qualified VENUE live sound environment
  - A qualified Avid Xpress, Avid Xpress DV, or Avid DNA system (AudioSuite only)

For complete system requirements visit the Digidesign website (www.digidesign.com).

Compatibility Information

Digidesign can only assure compatibility and provide support for hardware and software it has tested and approved.

For a list of Digidesign-qualified computers, operating systems, hard drives, third-party devices, and all the latest compatibility information, visit the Digidesign website (www.digidesign.com).

Register Your Plug-ins

If you purchase a plug-in online from the DigiStore (www.digidesign.com) using Internet Activation, you are automatically registered.

If you purchase a plug-in boxed version, check the enclosed Digidesign Registration Information Card for information about how to register online.

Registered users receive periodic software update and upgrade notices.

Please refer to the Digidesign website (www.digidesign.com) or the Digidesign Registration Information Card for information on technical support.

Working with Trillium Lane Labs Plug-ins

Refer to the *DigiRack Plug-ins Guide* for information on working with plug-ins, including:

- Inserting plug-ins on tracks
- Using Clip indicators
- Navigating the Plug-in window
- Adjusting parameters
- Automating plug-ins
- Using the Librarian

Conventions Used in This Guide

All Digidesign guides use the following conventions to indicate menu choices and key commands:

Convention	Action
File > Save	Choose Save from the File menu
Control+N	Hold down the Control key and press the N key
Control-click	Hold down the Control key and click the mouse button
Right-click	Click with the right mouse button

The following symbols are used to highlight important information:

User Tips are helpful hints for getting the most from your Pro Tools system.

Important Notices include information that could affect your Pro Tools session data or the performance of your Pro Tools system.

Shortcuts show you useful keyboard or mouse shortcuts.

Cross References point to related sections in the Pro Tools Guides.

About www.digidesign.com

The Digidesign website (www.digidesign.com) is your best online source for information to help you get the most out of your Pro Tools system. The following are just a few of the services and features available.

Registration Register your purchase online. See the enclosed registration form for details.

Support Contact Digidesign Technical Support or Customer Service; download software updates and the latest online manuals; browse the Compatibility documents for system requirements; search the online Answerbase or join the worldwide Pro Tools community on the Digidesign User Conference.

Training and Education Study on your own using courses available online or find out how you can learn in a classroom setting at a certified Pro Tools training center.

Products and Developers Learn about Digidesign products; download demo software or learn about our Development Partners and their plug-ins, applications, and hardware.

News and Events Get the latest news from Digidesign or sign up for a Pro Tools demo.

To learn more about these and other resources available from Digidesign, visit the Digidesign website (www.digidesign.com).

chapter 2

Installation

Installing Plug-ins

Installers for your plug-ins can be downloaded from the DigiStore (www.digidesign.com) or can be found on the plug-in installer disc (included with boxed versions of plug-ins). Additionally, an installer may also be available on a Pro Tools software bundle installer disc.

Installation steps are essentially the same, regardless of the bundle, package, or system you purchase.

Updating Older Plug-ins

Because the Trillium Lane Labs plug-ins installers contain the latest versions of Digidesign plug-ins, use them to update any Trillium Lane Labs plug-ins you may already own.

⚠ *Be sure to use the most recent versions of Trillium Lane Labs plug-ins available from the Digidesign website (www.digidesign.com).*

Installation

To install a plug-in:

1 Do one of the following:

- Download the installer for your computer platform from the Digidesign website (www.digidesign.com). After downloading, make sure the installer is uncompressed (.ZIP on Windows or .SIT on Macintosh).

– or –

- Insert the Installer disc into your computer.

2 Double-click the plug-in installer application.

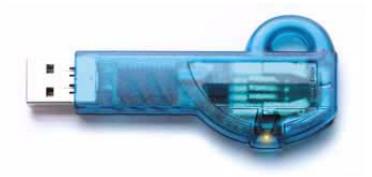
3 Follow the on-screen instructions to complete the installation.

4 When installation is complete, click Finish (Windows) or Quit (Macintosh).

When you open Pro Tools, you are prompted to authorize your new plug-in.

Authorizing Trillium Lane Labs Plug-ins

Trillium Lane Labs plug-ins are authorized using the iLok USB Smart Key (iLok), manufactured by PACE Anti-Piracy, Inc.



iLok USB Smart Key

The iLok is similar to a dongle, but unlike a dongle, it is designed to securely authorize multiple software applications from a variety of software developers.

This key can hold over 100 licenses for all of your iLok-enabled software. Once an iLok is authorized for a given piece of software, you can use the iLok to authorize that software on any computer.

The iLok USB Smart Key is not supplied with your plug-in or software option. You can use the one included with certain Pro Tools systems (such as Pro Tools|HD-series systems), or purchase one separately.

If you purchased a plug-in online at the DigiStore (www.digidesign.com), the authorization for your plug-in is automatically posted to your iLok account. Authorize the plug-in by downloading licenses from iLok.com to your iLok.

See the iLok Usage Guide for details, or visit the iLok website (www.iLok.com).

If you purchased a boxed version of a plug-in, it comes with either an Activation Code (on the included Activation Card) or an iLok License Card:

- To authorize plug-ins using an Activation Code, see "Authorizing Plug-ins Using an Activation Code" on page 6.
- To authorize plug-ins using an iLok License Card, see "Authorizing Plug-ins Using a License Card" on page 7

Authorizing Plug-ins Using an Activation Code

To authorize a plug-in using an Activation Code:

1 If you do not have an existing iLok.com account, visit www.iLok.com and sign up for an iLok.com account.

2 Transfer the license for your plug-in to your iLok.com account by doing the following:

- Visit http://secure.digidesign.com/activation.
- Input your Activation Code (listed on your Activation Card) and your iLok.com User ID. Your iLok.com User ID is the name you create for your iLok.com account.

3 Transfer the licenses from your iLok.com account to your iLok USB Smart Key by doing the following:

- Insert the iLok into an available USB port on your computer.
- Go to www.iLok.com and log in.
- Follow the on-screen instructions for transferring your licences to your iLok.

For information about iLok technology and licenses, see the electronic PDF of the iLok Usage Guide.

4 Launch Pro Tools.

5 If you have any installed unauthorized plug-ins or software options, you are prompted to authorize them. Follow the on-screen instructions to complete the authorization process.

Authorizing Plug-ins Using a License Card

License Cards are specific to each plug-in or software option. You will receive the appropriate License Cards for the plug-ins that you purchase. License Cards have a small punch-out plastic chip called a GSM cutout.

For additional information about iLok technology and authorizations, see the electronic PDF of the iLok Usage Guide.

To authorize a plug-in using a License Card:

1 Insert the iLok into an available USB port on your computer.

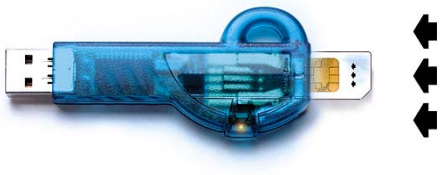
2 Launch Pro Tools. You are prompted to authorize any installed unauthorized plug-ins or software options.

If you are already using a demo version of the plug-in or software option, launch Pro Tools before you insert the iLok, then insert the iLok into any available USB port when prompted by Pro Tools.

3 Follow the on-screen instructions until you are prompted to insert the License Card into the iLok.

4 Separate the GSM cutout from the larger protective card by pulling it up and out with your thumb. Do not force the cutout down with your finger.

5 Insert the GSM cutout into the iLok. Visually verify that the metal portion of the cutout makes contact with the iLok's metal card reader.



iLok with License Card

6 Follow the on-screen instructions to complete the authorization process for each plug-in.

7 After the authorization has completed, remove the GSM cutout from the iLok. (If you have to remove the iLok from the computer to remove the cutout, be sure to re-insert the iLok in any available USB port on your computer when you are finished.)

Removing Plug-ins

If you need to remove a plug-in from your system, follow the instructions below for your computer platform.

Windows

To remove a plug-in:

1 From the Start menu, choose Settings > Control Panel and double-click Add or Remove Programs.

2 Select the plug-in from the list of installed applications and click the Change/Remove button.

3 Follow the on-screen instructions to remove the plug-in.

4 When removal is complete, click OK to close the window.

Mac OS X

To remove a plug-in:

1 Locate and open the Plug-ins folder on your Startup drive (Library/Application Support/Digidesign/Plug-ins).

2 Do one of the following:

- Drag the plug-in to the Trash and empty the Trash.

– or –

- Drag the plug-in to the Plug-ins (Unused) folder.

chapter 3

Adjusting Trillium Lane Labs Plug-in Parameters

Adjusting Plug-in Parameters

You can adjust plug-in controls by dragging the control's slider or knob, or by typing a value into the control's text box. Additionally, some plug-ins have switches that can be enabled by clicking on them.

To adjust a plug-in control:

1 Begin audio playback so that you can hear the control changes in real time.

2 Adjust the controls of the plug-in for the effect you want. Refer to "Editing Parameters Using a Mouse" on page 9 and "Editing Parameters Using a Computer Keyboard" on page 10.

Closing the plug-in will save the most recent changes.

Editing Parameters Using a Mouse

You can adjust rotary controls by dragging horizontally or vertically. Parameter values increase as you drag upward or to the right, and decrease as you drag downward or to the left.

Keyboard Shortcuts

- For finer adjustments, Control-drag (Windows) or Command-drag (Macintosh) the control.
- To return a control to its default value, Alt-click (Windows) or Option-click (Macintosh) the control.

Editing Parameters Using a Computer Keyboard

Some controls have text boxes that display the current value of the parameter. You can edit the numeric value of a parameter with your computer keyboard.

If multiple Plug-in windows are open, Tab and keyboard entry remain focused on the plug-in that is the target window.

To change control values with a computer keyboard:

1 Click the text box corresponding to the control that you want to adjust.

2 Change the value.

- To increase a value, press the Up Arrow on your keyboard. To decrease a value, press the Down Arrow on your keyboard.

– or –

- Type the desired value.

In fields that support values in kilohertz, typing "k" after a number value will multiply the value by 1,000. For example, type "8k" to enter a value of 8,000.

3 Do one of the following:

- Press Enter on the numeric keyboard to input the value and remain in keyboard editing mode.

– or –

- Press Enter on the alpha keyboard (Windows) or Return (Macintosh) to enter the value and leave keyboard editing mode.

To move forward through the different control fields, press the Tab key. To move backward, press Shift+Tab.

Editing Parameters Using a Scroll Wheel

Some controls have text boxes that display the current value of the parameter. You can edit the numeric value of a parameter using a scroll wheel.

To change control values using a scroll wheel:

1 Click the text box corresponding to the control that you want to adjust.

2 To increase a value, scroll up with the scroll wheel. To decrease a value, scroll down with the scroll wheel.

Toggling Switches

To toggle a switch:

- Click the switch.

chapter 4

TL Aggro

Introduction

TL Aggro is a TDM and RTAS compressor plug-in that is modeled on vintage FET compressors. At moderate settings, TL Aggro is designed to sound smooth and transparent, perfect for vocals and acoustic instruments. Crank TL Aggro up for maximum aggressiveness and it instantly adds character and intensity to guitars and drum tracks.

Figure 1. TL Aggro plug-in

Analog Compression

Compression is a common audio processing technique that is essential to many recording styles. A compressor is a specialized type of amplifier that acts to reduce the dynamic range between the quietest and loudest peaks of an audio signal. When dynamic range is compressed, this highlights quieter parts of an audio signal while taming the loudest parts. Heavy use of compression on percussion, instruments, and vocals is a staple in musical genres such as rock and pop.

Before the introduction of digital technology in the studio, compressors were typically designed around a set of analog components. Various compressor circuit designs are known for their distinctive sound and characteristics. Popular analog compressors are often designed around optical isolator, VCA (voltage controlled amplifier), or FET (field effect transistor) based circuits that produce the compression effect.

TL Aggro

TL Aggro implements a unique compressor topology based on a traditional analog FET design, with several updates for the digital age. Figure 2 shows the different modules of TL Aggro and how they interact with the audio signal.

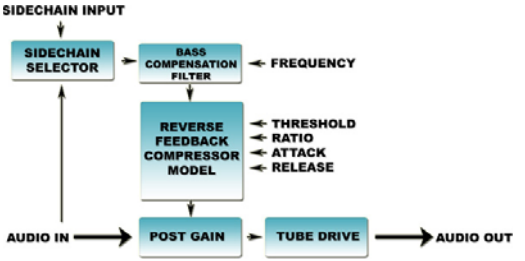


Figure 2. TL Aggro signal flow, processing, and controls

TL Aggro uses a reverse feedback system common to many analog compressors. In essence, this means that the compressor is not compressing the input signal but rather analyzing and compressing the already compressed output signal. Sound weird? It is. Reverse-feedBack is a strange and paradoxical concept. It can lead to strange and chaotic behavior if not well-tamed. In fact, at least one well known and popular hardware compressor that uses a reverse feedBack topology becomes marginally unstable at extreme compression settings. Despite this sometimes unpredictable behavior, the reverse feedBack model produces a desirable and unique compression sound.

TL Aggro adds modern digital conveniences to the reverse feedBack model. Precise bass compensation provides for improved tracking of bass heavy instruments or a complete stereo mix. TL Aggro provides linked stereo operation to preserve stereo imaging as well as full sidechain support. A tube drive module adds additional tube-style distortion if desired.

TL Aggro uses a program dependent release which provides more natural sounding compression. In essence, the program dependent release works to slow down the release time of compressor so that it more smoothly rides the average loudness of the audio material.

The most unique feature of TL Aggro is its Threshold control. Most reverse-feedBack compressors do not implement a Threshold control typical to non-FET compressors. Instead, they provide an input control that increases the amount of compression as the unit is driven harder. However, an input control adjustment is often less intuitive than a Threshold control.

Implementing a Threshold control into the operation of TL Aggro has two specific side-effects. At the extreme setting of a high threshold, high ratio, fast attack, and a slow release, TL Aggro can overshoot in compression and become "sticky" with a high gain reduction. Sonically, this sounds like "pops" in the output signal. In more technical terms, TL Aggro is becoming marginally unstable. In this scenario you can alleviate the problem by doing one or more of the following:

- Lower the Threshold
- Reduce the Ratio
- Reduce the Attack
- Increase the Release

The second side effect is that for a given set of Ratio and Attack settings, the compressor has a finite range of available gain reduction. At some cutoff point on the Threshold knob, you might find that compressor ceases to apply anymore compression to the signal. To acquire more compression range, increase the Ratio slider, or alternatively increase the Attack speed.

The reverse-feedBack model combined with the Threshold control and additional features like Bass Compensation and Tube Drive gives TL Aggro a wide range of compression styles once you understand how it operates. The ability to adjust threshold gives TL Aggro a distinctive advantage over traditional reverse feedBack designs, both in terms of functionality and sonic character.

TL Aggro Controls

Compression

Compressions controls

TL Aggro provides the standard compression controls Threshold, Ration, Attack, Release, and Post Gain.

Threshold

The Threshold control sets the amplitude level at which the compressor begins to affect the input signal. The values indicated on the Threshold knob are in negative dB. At the default 0 dB setting, TL Aggro will pass the audio signal through at unity gain and will have no effect on the audio. As the Threshold knob is turned clockwise (click and drag up), the threshold will be lowered deeper into the input signal and result in more gain reduction as the compressor becomes sensitive to more of the incoming audio signal.

Ratio

The Ratio control indicates the degree at which TL Aggro is reducing dynamic range. The Ratio slider increases the amount of compression as the slider is pushed upwards, by increasing the amount of gain reduction in the output signal relative to the input signal. Additionally, as the ratio is increased, the "knee" of compression curve is made tighter. At lower ratio settings, TL Aggro has a gentle knee in the compression curve.

Attack and Release

The Attack control controls the amount of time it takes TL Aggro to begin compression once the audio signal has reached the threshold. Slow attack times tend to promote overall brightness and high frequency audio within the compressed audio signal.

Conversely, the Release control controls the time it takes TL Aggro to return to unity gain once the audio signal has fallen back below the threshold. TL Aggro uses a program dependent release which slows down the release time to more smoothly ride the average loudness of the audio material.

Turning the Attack and Release knobs clockwise increases the reaction speed of the compressor. 1 is the slowest setting and 10 is the fastest setting.

Post Gain

The Post Gain control lets you make up for the signal gain lost through compression. The values indicated on the knob are in dB. At maximum setting, 36 dB of gain can be applied to the compressed signal.

Bass Compensation

Bass Compensation controls

The Bass Compensation section of TL Aggro affects the compressor's side-chain circuitry. By default, Bass Compensation is enabled as indicated by the illuminated green light. To disable, toggle the switch in the section by clicking it. The green lamp will turn off to indicate that Bass Compensation has been switched out of the side-chain signal path.

When Bass Compensation is enabled, the compressor becomes less sensitive to bass frequencies in the input signal. This models the sensitivity of the human ear, which is also much less sensitive to low frequencies. For most signal sources, enabling Bass Compensation will reduce the total amount of gain reduction that TL Aggro induces, but the result will often be more natural sounding with less pumping and breathing. For example, Bass Compensation sounds great on bass guitar or when you have TL Aggro on your master fader as stereo bus compressor.

Additionally, TL Aggro provides a cutoff frequency control to tailor the sound of the bass compensation. This acts as a high pass filter and the values indicated above the Bass Compensation slider are in Hertz. As the slider increases from left to right, the compressor will be even less reactive to low frequencies.

For example, place a stereo TL Aggro on a full stereo drum mix. Set the compressor for moderate to high gain reduction levels, enable the Bass Compensation, and slide the frequency control from left to right. As the cutoff frequency is increased, you will hear more and more of the kick drum "punch" through the mix and become louder relative to snare or cymbals.

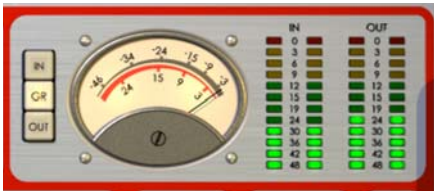
Tube Drive

Tube Drive control

The Tube Drive module adds subtle even order distortion after the compression processing, simulating the effect of a vacuum tube amplifier. This provides a difference in the sonic signature of TL Aggro and is most noticeable on audio with harmonic content such as piano and acoustic guitar.

To engage the Tube Drive, turn the Tube Drive rocker switch to on by clicking it. The Tube Drive rocker switch and tube light up when Tube Drive processing is on. The amount of distortion increases with the output level.

Meters



LED Meters, In and Out

LED Meters

The LED meters display the peak input and output levels. The LED meters are normalized to 0 dB at digital full-scale.

Note that when TL Aggro is inserted on a mono track, only the left LED meters will display levels.

Needle Meter

The Needle meter shows input, output, and gain reduction levels, selectable by the buttons directly to the left of the meter. By default, the GR (gain reduction) button is selected and the meter displays the amount of gain reduction TL Aggro is applying on the input.

When in GR mode, the needle instantaneously reacts to peak reductions that occur. The red scale of the meter indicates compression in dB. This gives you an accurate representation of the total amount of gain reduction being applied. However, the release speed of the needle is limited to give it more natural motion. At fast release settings, the instantaneous gain reduction might be less than what it is presented by the needle.

In Input (IN) or Output (OUT) mode, the needle meter displays an average of the signals roughly approximating the RMS (root-mean-square) strength of the signal. The grey scale on the meter represents the input and output levels in negative dB This gives you a better representation of the overall loudness of the signal with respect to the LED meters.

Using the Side-Chain Input

Using a Side-Chain Input to TL Aggro lets you direct audio from another track or hardware input in your Pro Tools session to drive the input of the TL Aggro compressor. This is usually achieved by sending the audio from the desired channel to a bus and setting the side-chain input on TL Aggro to the same bus.

⚠ *On versions of Pro Tools prior to 7.0, RTAS plug-ins do not provide side-chain processing on TDM systems. Use the TDM version of TL Aggro if you require side-chain processing on a TDM system.*

For more information on using Side-Chain Input, see the DigiRack Plug-ins Guide.

chapter 5

TL AutoPan

Introduction

TL AutoPan is a TDM and RTAS plug-in for Pro Tools. TL AutoPan is an automatic panning plug-in that pans a mono input to a multichannel (stereo, LCR, quad, or 5.0) output based on a LFO, envelope follower, MIDI Beat Clock, or manual automation. TL AutoPan is ideal for rhythmic panning effects based on your Pro Tools session tempo. It also provides an easy and elegant way to automate panning to multichannel surround formats for post-production.

⚠ *RTAS on Pro Tools LE only supports mono-to-stereo.*

Figure 1. TL AutoPan plug-in, TDM version

TL AutoPan Controls

The TL AutoPan interface is divided into several sections, each of which is described below.

Output Meters

The Output meters display the amplitude of the outgoing audio. In mono-to-stereo mode, a two meter bar is shown. In mono-to-LCR, quad, or 5.0 mode, three, four, or five channels are shown respectively.

Output meters (L, C, R, Ls, Rs)

The Clip indicator lights red when the channel has clipped. The clip indicator for each channel can be cleared by clicking it.

Panner Section

The Panner section provides different controls for different output channel configurations. TL AutoPan in mono-to-stereo and mono-to-LCR formats provide controls common to all output configurations: Output, Width, and Manual. TL AutoPan mono-to-quad and mono-to-5.0 formats provide additional controls depending on the Path selection: Angle and Place, or Spread. Additionally, the Panning Source selector, Panning display, and Path selectors are common to all output channel configurations.

Output

The Output slider lets you cut or boost the output signal level from –24 dB to +12 dB.

Panner section, mono-to-stereo, left to right path selected

Width

The Width slider controls the width of the panning field. At 100%, the panning field is at its widest. At 0%, the panning field is centered and stationary. The Width slider effectively determines the amount of LFO or Envelope control on the pan position.

Manual

The Manual slider directly controls the pan position, this lets you manually control the pan position from a control surface or by using automation. The amount of manual control is affected by the setting of the Width slider. For full manual control, set the Width slider to 0%. When the Width slider is at 100%, the Manual slider has no effect on the pan position. When Width is set to 50%, the LFO sweeps the position through 50% of its range and the Manual slider lets you move the position of that 50% range.

Angle

The Angle slider adjusts the orientation of the panning field from –90° to +90°. At 0°, the panning field is oriented strictly left/right. At –90° or +90°, the panning field is oriented strictly front/back.

Panner section, mono-to-5.0, left to right path selected

The Angle slider is only available with mono-to-quad and mono-to-5.0 formats, and a left to right or right to left path selected.

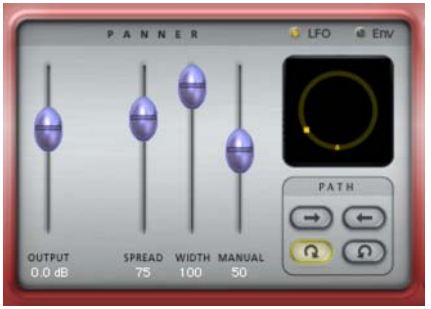
Place

The Place slider adjusts the front/back placement of the panning field. At 0%, the panning field is centered front/back. At +100%, it is placed all the way front. At –100%, it is placed all the way back.

The Place slider is only available with mono-to-quad and mono-to-5.0 formats, and a left to right or right to left path selected.

Spread

The Spread slider opens or constricts the field of panning. At 100%, the spread of the panning field is at its greatest. At 0%, the spread of the panning field is completely constricted, and the sound is centered and stationary (left/right and front/back).



Panner section, mono-to-5.0, clockwise path selected

The Spread slider is only available with mono-to-quad and mono-to-5.0 formats, and a circular path (clockwise or counterclockwise) selected.

Panning Source

Click LFO or ENV to select the source for panning. When the Source is set to LFO, panning is controlled by the LFO and its controls (see "LFO Section" on page 20). When the Source is set to Envelope (ENV), panning is controlled by the Envelope Detector and its controls (see "Envelope Section" on page 23). The Envelope Detector can be triggered by the panned audio signal, or by a side-chain input (see "Using the Side-Chain Input" on page 24).

Panning Source buttons

Panning Display

The Panning display graphically represents the panning field and the location of the sound source within that field.

Panning display, mono-to-5.0, left to right path selected

Sound Location Indicator This bright yellow light indicates the location of the sound source.

Panning Field Indicator This is the grey line on which the yellow Sound Location indicator travels and indicates the panning field.

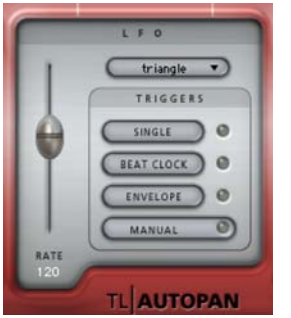
Path

The Path selectors determine whether the audio signal pans left to right, right to left, or in a circular motion clockwise, or counterclockwise. The circular path selectors (clockwise and counterclockwise) are only available with mono-to-quad and mono-to-5.0 formats.

Path selectors, left to right path selected

LFO Section

The LFO section provides controls for the Low Frequency Oscillator that can be used to modulate panning. The controls in the LFO section only affect the panning if LFO is selected as the panning source in the panning section (see “Panning Source” on page 19).



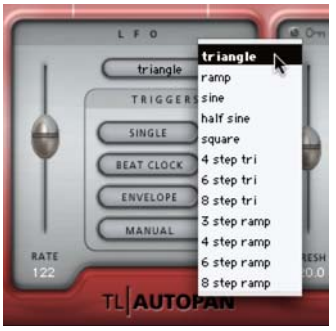
LFO section

⚠ *When the Panner section is set to Envelope (ENV), the controls in the LFO section have no effect on panning.*

Rate

The Rate slider adjusts the rate of the LFO in beats per minute. When Link to Tempo is activated, the slider is ignored and the Tempo LCD always displays the current session tempo (see “Tempo LCD” on page 22).

Waveform

The Waveform selector determines the wave shape used by the LFO. The waveform shape in use is graphically depicted by the movement of the Sound Location indicator in the Panning display.

Selecting the LFO Waveform

LFO Triggers

By default, the LFO cycles continuously through the selected waveform. The LFO can be set to cycle through the selected waveform just once, or it can be triggered by MIDI Beat Clock, the Envelope, or manually.

LFO Triggers

Single

When the Single trigger is selected, the LFO will cycle thru the waveform once only and then stop.

Beat Clock

When the Beat Clock trigger is selected, the LFO synchronizes to MIDI Beat Clock. TL AutoPan receives Beat Clock signal every 64th-note. The Duration menu determines how often the Beat Clock signal triggers TL AutoPan, ranging from every 16th-note to every 4 bars. When Beat Clock signal is received, the Beat Clock trigger light blinks brightly. Using the Beat Clock function enables TL AutoPan to produce consistent panning results, ensuring that the LFO is always in the same state at each beat.

Envelope

When the Envelope trigger is selected, the LFO is triggered directly by the Envelope Detector, which analyzes the amplitude of the audio signal. If the Side-Chain Input selector in the Envelope section is activated, then the side-chain audio signal is used instead. When activated, the Envelope light blinks brighter when an audio signal is detected. The threshold level can be adjusted using the Threshold control in the Envelope section.

If the Envelope Detector is completely released due to previous portions of the audio signal going above threshold, a trigger occurs the next time the audio goes above the threshold level. Another trigger will not happen until the Envelope Detector has completely released after the audio goes below the specified threshold. Increasing the release time reduces the rate at which triggers can occur and decreasing the release time increases the rate at which triggers can occur.

Manual

When the Manual trigger is selected, the LFO is triggered manually. This can be especially useful if you want to trigger the LFO using Pro Tools automation.

With control surfaces and automation, the Manual trigger acts like an on/off switch and triggers the LFO every time it changes state.

Tempo Controls

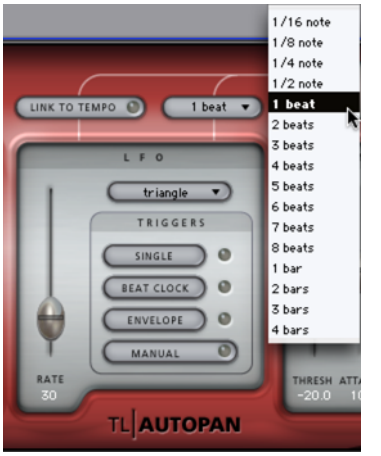
Link To Tempo

When the Link To Tempo option is enabled, the LFO rate is set to the Pro Tools session tempo, and any tempo changes in the session are followed automatically. In addition, the LFO rate slider is ignored and the tempo displayed in the LCD always displays the current session tempo.

Tempo controls

Duration Selector

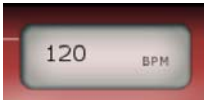
The Duration selector works in conjunction with the session tempo, LFO rate, and Beat Clock trigger. By default, Duration is set to 1 bar. At that setting, the LFO cycles once within one bar. When Duration is set to 1 beat, the LFO cycles within the duration of one beat. When Link to Tempo is enabled, the Duration menu allows the LFO rate to be set as a function of the tempo of the Pro Tools session. The Duration menu also controls how often the Beat Clock trigger is activated.



Selecting Duration

Tempo LCD

The Tempo LCD displays the tempo in BPM. The value in the Tempo LCD can also be edited directly by clicking it and typing a new value.



Tempo LCD

Envelope Section

When Envelope (ENV) is selected as the Panning source, Panning (as shown in the Panning display) is controlled by the audio signal and the Envelope section controls.

Envelope section

⚠ *When Envelope (ENV) is not selected as the Panning Source, the controls in this section have no effect on the sound.*

Side-Chain Input

When the Side-Chain Input selector (the key icon) is enabled, the audio for the Envelope Detector is taken from the side-chain input rather than the current track. Select the Side-Chain Input using the Pro Tools Key Input selector at the top of the plug-in window.

Side-Chain Input selector enabled

Threshold

The Threshold slider sets the amplitude level required for the Envelope Detector. The LFO Envelope Detector light blinks brighter when audio is detected above the threshold.

Attack

The Attack slider sets the attack rate of the Envelope Detector.

Release

The Release slider sets the release rate of the Envelope Detector.

Using TL AutoPan

TL AutoPan can be used for dynamic panning effects based on a Low Frequency Oscillator (LFO), an amplitude envelope (ENV), or manual control. TL AutoPan makes it easy to pan to the beat of a music track, as well as panning "fly-around" effects. The following section describes two possible scenarios for using TL AutoPan: panning to the beat for rhythmic panning effects and surround panning effects for post production.

Panning to the Beat

TL AutoPan lets you synchronize the LFO to MIDI Beat Clock for rhythmic panning effects.

To synchronize TL AutoPan to MIDI Beat Clock:

1 Make sure that your session tempo matches the tempo of the music.

2 Insert a mono-to-stereo instance of TL AutoPan on the mono audio track containing the audio you want to pan. The track's channel width changes from mono-to-stereo.

3 In the TL AutoPan Plug-in window, enable Link To Tempo. This sets the LFO rate to follow the session tempo.

4 Select the desired duration from the Duration selector. For example, select 2 Beats.

5 Select the desired waveform for the LFO from the Waveform selector. For example, select 4 Step Triangle.

6 Enable Beat Clock for the LFO Trigger. This ensures that the LFO is synchronized to the beat.

7 Play back the session to hear the panning effect.

Post Production Panning

(Pro Tools|HD Systems Only)

TL AutoPan lets you pan a mono track to a greater than stereo (LCR, Quad, or 5.0) output in a surround path. This is especially useful for post-production applications. The following example describes how to use TL AutoPan to pan a "mosquito" sound in 5.0 surround.

To pan a mono track to 5.0 with TL AutoPan:

1 Insert a mono-to-5.0 instance of TL AutoPan on the mono track containing the audio you want to pan. The track's channel width changes from mono-to-5.0.

2 Select a 5.0 output path from the track's Output selector.

3 In the TL AutoPan Plug-in window, select a clockwise or counter-clockwise Path as desired.

4 Adjust the Spread and Width sliders as desired.

Try automating Spread and Width to alter the positioning of the panned sound.

5 From the LFO Waveform selector, select Half Sine.

Try automating the Manual control instead of using the LFO to create a more erratic panning of the "mosquito" sound.

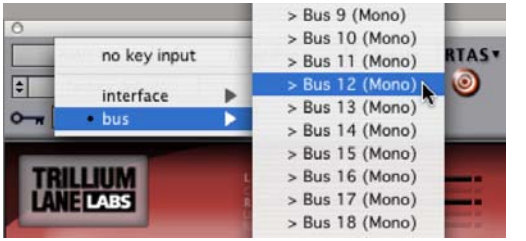
6 Adjust the Rate slider as desired.

Try automating Rate to alter the speed of the panned sound over time.

7 Play back the session to hear the "mosquito" flying around your head.

Using the Side-Chain Input

The Side-Chain Input option in TL AutoPan lets you direct audio from another track in your Pro Tools session to the Envelope Detector. This is achieved by sending the audio from the desired channel to a bus and setting the side-chain input on TL AutoPan to the same bus.



Selecting a bus as the Side-Chain Input

For more information on using the Side-Chain Input, see the DigiRack Plug-ins Guide.

chapter 6

TL Drum Rehab

Introduction

TL Drum Rehab is an RTAS plug-in for Pro Tools that provides engineers with a powerful tool for the precise drum replacement and enhancement of drum tracks in real-time, regardless of performance, equipment, or recording limitations in the original track. Use TL Drum Rehab to do everything from replacing poor drum sounds to remixing drum performances with completely new and different sounds.

⚠ *TL Drum Rehab is a mono plug-in only. It cannot be used on multi-channel tracks (stereo or greater).*

TL Drum Rehab Features

- Editable sample-accurate trigger locations
- Dynamic multi-sample support of up to 16 layers (Zones)
- Envelope and tone shaping controls
- Undo
- Powerful sample browser and converter
- Favorites
- Custom file format (DRP)
- Tracking, compression, and quantization
- Triggering sensitivity and filtering controls
- Random sample selection
- No Latency mode

Figure 1. TL Drum Rehab plug-in

Using TL Drum Rehab

TL Drum Rehab can be used to reinforce a drum performance with sampled drum sounds or can be used to replace the original drum sounds entirely with sampled drums.

For most applications of TL Drum Rehab you only need to use the Trigger panel (see "Trigger Panel Display and Controls" on page 32).

For more complicated drum parts, you may want to use the Expert panel to commit or ignore specific detected triggers, as well as quantize or edit the location of committed triggers (see "Expert Panel Display and Controls" on page 38).

To edit sample layers and adjust the sound of samples, use the Samples panel ("Samples Panel Display and Controls" on page 42).

TL Drum Rehab Workflow Examples

The following section describes two possible workflow examples for using TL Drum Rehab. The first example uses TL Drum Rehab to replace the kick drum sound on a mono kick drum track in real-time. The second example describes a more complicated procedure, using TL Drum Rehab's Expert panel to replace a high hat track and quantize the replacement samples.

Workflow Example 1

Using TL Drum Rehab to replace a kick drum sound:

1 Insert TL Drum Rehab on a mono audio track of a kick drum recording.

⚠ *TL Drum Rehab is a mono plug-in only. It cannot be used on multi-channel tracks (stereo or greater).*

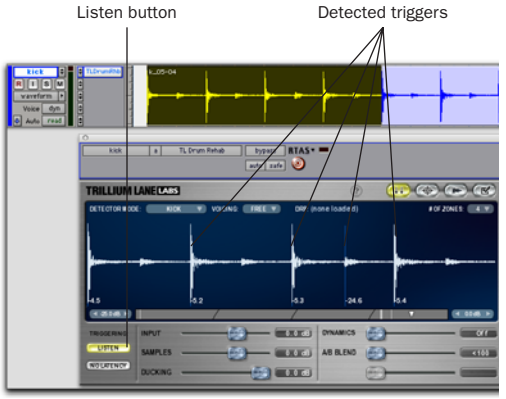
2 Make a short selection to set TL Drum Rehab's parameters. For example, make a two bar selection.

3 In TL Drum Rehab's Trigger panel (see "Trigger Panel Display and Controls" on page 32), select Kick from the Detector Mode pop-up menu (see "Detector Mode" on page 33).

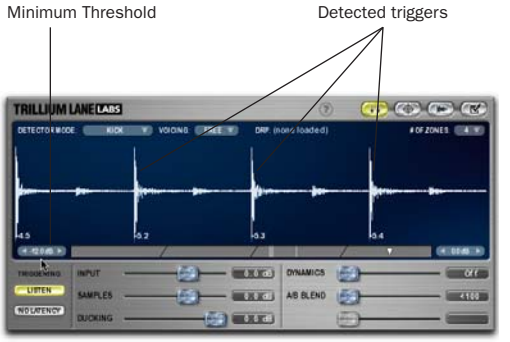
4 Enable Listen mode by clicking the Listen button. The Listen button lights when Listen mode is enabled.

💡 *Create a Selection memory location for your two-bar selection. This lets you quickly return to the original selection in case you want to further adjust TL Drum Rehab's settings.*

5 Start playback in Pro Tools. As Pro Tools plays back, TL Drum Rehab "listens" to the track, and analyzes the audio for attack transients and marks those sample locations with triggers. These triggers play back the samples loaded into TL Drum Rehab to replace or enhance the drum sounds on the audio track.



6 In this example, there is some bleed from the snare on the kick track and TL Drum Rehab detected a trigger on one of the snare hits. Adjust the Minimum Threshold control so that only the kick drum hits are detected (see "Minimum and Maximum Threshold Controls" on page 36).



7 After adjusting the Minimum Threshold, play back the selection to re-detect triggers.

8 In TL Drum Rehab's Library browser (see "TL Drum Rehab Library Browser" on page 46), locate the drum sample or DRP file you want to load. You can audition samples and DRP files by enabling the Auto-Audition option and selecting the sample or DRP file you want audition in the browser.

DRP files are a collection of samples loaded into TL Drum Rehab's Zones and Clips that work together to create a realistic and dynamic drum sound. For more information on DRP files, see "DRP Name Display" on page 33.

9 Do one of the following:

- To load a DRP file into TL Drum Rehab, double click the desired DRP file in the Library browser.

– or –

- To load a sample into TL Drum Rehab, double click the desired sample (WAV, AIF, or SD2) in the Library browser. The sample is loaded into the currently selected Zone (see "Velocity Map and Velocity Zones" on page 35).

10 In the Trigger panel, decrease the Input slider to lower the volume of the original kick sound, and increase the Samples slider to increase the volume of the replacement kick sample. This way you can effectively augment or replace the original drum sound with the sampled drum sound. You can also adjust the Dynamics control to have the amplitude of the original drum sound affect the playback amplitude (velocity) of the sampled drum sound. (For more information, see "Playback Controls" on page 36.)

You can also use the Ducking control to mask track's audio with the triggered sample (see "Playback Controls" on page 36).

11 In the Pro Tools Transport window, press Return to Zero, and press Play to begin playback from the beginning of the track. TL Drum Rehab plays back the selected drum sample at every detected trigger in the original track, all in real time.

During playback, you can further adjust TL Drum Rehab's playback controls as desired to get just the right blend between the original drum sound and the replacement drum sound.

12 Once you are satisfied with the result, do one of the following:

- Bus and record the output of TL Drum Rehab to a new audio track.
- Use Bounce to Disk to render the replacement track and import it back into the session. For more information on Bounce To Disk, see the *Pro Tools Reference Guide*.
- Leave the plug-in inserted and continue to use it during playback.

⚠ *When using committed triggers, and bussing and recording TL Drum Rehab to another track, it is strongly recommended that you set the H/W Buffer Size (Setup > Playback Engine) to 2048 samples. This is the optimal setting for recording TL Drum Rehab. Lower buffer settings may result in offset triggers.*

Workflow Example 2

Using the TL Drum Rehab Expert panel to replace and quantize a high hat sound:

1 Insert TL Drum Rehab on a mono audio track containing a high hat recording.

2 As in workflow example 1, do the following:

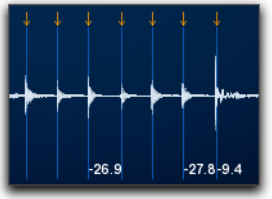
- Load the desired DRP file, or load samples (WAV, AIF, or SD2) into Zones.
- Make a Timeline selection.
- In the Trigger panel, select the appropriate Detector Mode setting.
- Enable Listen mode.
- Play back the selection to detect triggers.

3 In the Expert panel, click Commit All.

Committed triggers play back regardless of whether or not Listen mode is enabled.
TL Drum Rehab lets you edit the position of committed triggers by clicking and dragging, which can be useful if you are working with drum sounds that do not have clear attack tran-

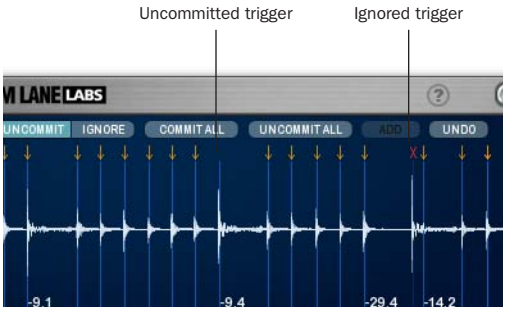
sients, or if you need to compensate for the delay inherent in non-close miked recordings (such as overs for the cymbals). Committed triggers are indicated by a red arrow.

For more information on working with committed triggers, see "Commit" on page 39.



4 If there are some committed triggers that you do not want to play back, click either Uncommit or Ignore.

Uncommitted triggers do not playback if Listen mode is disabled, but do playback if it is enabled (because they are re-detected in Listen mode, so a new trigger is generated). Ignored triggers do not playback regardless of whether or not Listen mode is enabled. When working with committed triggers, Listen mode is typically disabled so that TL Drum Rehab doesn't reanalyze the selection's attack transients and generate new triggers after you have already edited any committed triggers.



5 Disable Listen mode.

6 For no latency on playback, enabled No Latency mode (see "Triggering Controls" on page 36).

7 Select the desired quantize resolution from the Quantize To pop-up menu (see "Quantize To" on page 41).

8 Adjust the Quantize slider to achieve the desired amount of quantization. 100% hard quantizes committed triggers to the selected Quantize To resolution (for example, sixteenth notes).

9 Adjust TL Drum Rehab's playback controls as desired (see "Playback Controls" on page 36).

10 Once you are satisfied with the result, do one of the following:

- Bus and record the output of TL Drum Rehab to a new audio track.
- Use Bounce to Disk to render the replacement track and import it back into the session. For more information on Bounce To Disk, see the *Pro Tools Reference Guide*.
- Leave the plug-in inserted and continue to use it during playback.

When using committed triggers, and bussing and recording TL Drum Rehab to another track, it is strongly recommended that you set the H/W Buffer Size (Setup > Playback Engine) to 2048 samples. This is the optimal setting for recording TL Drum Rehab. Lower buffer settings may result in offset triggers.

TL Drum Rehab Controls and Displays

When using TL Drum Rehab, most operations take place in one of two displays: the Main window and the Library Browser.

TL Drum Rehab Main Window Provides access to four different control panels: Trigger, Expert, Sample, and Preferences.

TL Drum Rehab Library Browser Is to the right of the Main window and lets you select samples for playback, and also lets you manage your sample library.

TL Drum Rehab Main window and Library browser

TL Drum Rehab Main Window

The TL Drum Rehab Main window lets you access four different panels: Trigger, Expert, Samples, and Preferences.

Trigger Panel Provides the most commonly used controls for detecting triggers and playback controls (see "Trigger Panel Display and Controls" on page 32).

Expert Panel Lets you precisely edit the placement of triggers (see "Expert Panel Display and Controls" on page 38).

Samples Panel Lets you view and manage drum samples loaded into TL Drum Rehab ("Samples Panel Display and Controls" on page 42).

Preferences Panel Lets you edit TL Drum Rehab's preferences (see "Preferences Panel Display and Controls" on page 45).

A Note About TL Drum Rehab Control Sliders

TL Drum Rehab has several control sliders that are global controls and are available in more than one panel. For example, the A/B Blend control is available in the Trigger, Expert, and Samples panels. Adjusting a global control in one panel view updates that control in all panel views. These controls can be automated and are displayed in a luminous blue.

A/B Blend slide, a global control

Other sliders are unique to a single panel, such as the Quantize control in the Expert panel. These controls cannot be automated and are displayed in a luminous gray.

Quantize slider, a unique control

Not all sliders are active controls in every panel. For example, the last slider in the Trigger panel is grayed out.

Inactive slider

Trigger Panel Display and Controls

The Trigger panel provides most of the controls you need to use TL Drum Rehab (see Figure 2). The Trigger panel lets you identify triggers and set up Velocity Zones for sample playback. Additionally, the trigger panel provides several playback controls.

To access the trigger panel:

- Click the Trigger Panel button.

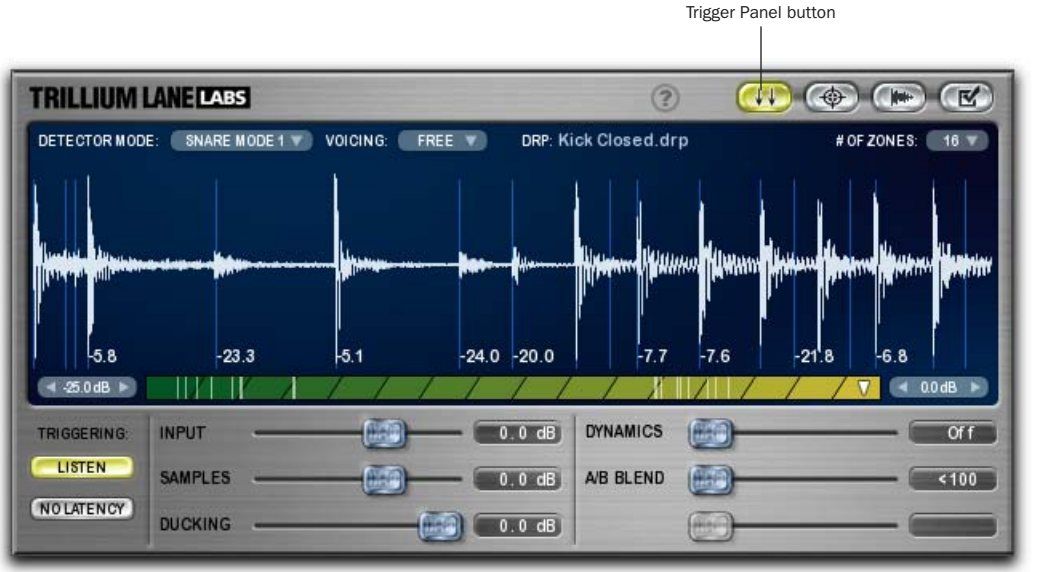


Figure 2. Trigger panel

Detector Mode

Use the Detector Mode pop-up menu to select the algorithm for trigger detection. TL Drum Rehab provides four detection algorithms: Snare Mode 1, Snare Mode 2, Kick, and Tom.

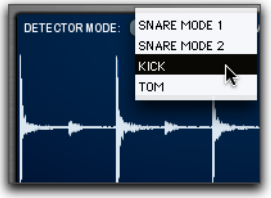
Snare 1 Use Snare 1 for detecting flams and rolls. Snare 1 is a more sensitive trigger for busier snare tracks.

Snare 2 Use Snare 2 for detecting snare hits and cymbals. Snare 2 is a more general purpose detection setting.

Kick Use Kick for lower frequency sounds.

Tom Use Tom for mid-range sounds.

Depending on the type of material on the track, experiment and try different settings to get the results you want.



Selecting the detection algorithm from the Detector Mode pop-up menu

Voicing

Use the Voicing pop-up menu to select whether the triggered sample plays back freely (the entire sample plays when triggered) or is choked (the triggering of the next sample silences the sounding sample). Typically, you would select Free for cymbals, since they tend to ring, and Choke for drums, like kicks and snares. However, you may find that you get some interesting effects by trying something a little different, such as selecting Choke for cymbals.

Selecting the voicing

DRP Name Display

The DRP Name display displays the name of the currently loaded DRP file above the Waveform display in the Trigger and Samples panels. DRP files are a collection of samples loaded into TL Drum Rehab's Zones and Clips that work together to create a realistic and dynamic drum sound. DRP files can contain a up to 16 Zones, two positions (A and B), and four clips per position. TL Drum Rehab comes with a full library of DRP files.

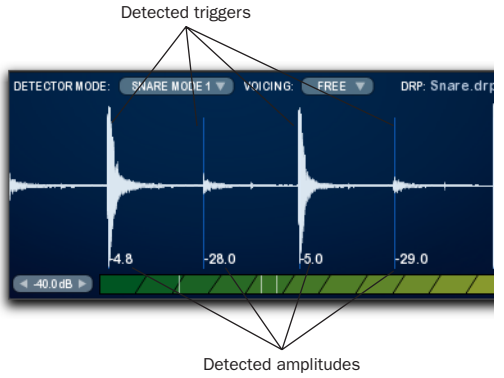
DRP display

To load a DRP file:

- In the Library browser, locate and double-click the DRP file you want to load. All samples in the DRP file are loaded into their assigned Zones and Clips.

Waveform Display

The Waveform display provides a graphic representation of the selected track's audio, and also displays detected triggers and velocities (amplitudes). Detected triggers are displayed as light blue lines on the waveform.



Waveform display with detected triggers and amplitudes

If TL Drum Rehab detects unwanted triggers (such as kick bleed through on the snare track), refer to the detected amplitude for the unwanted triggers and adjust the Minimum Threshold control accordingly (see "Minimum and Maximum Threshold Controls" on page 36).

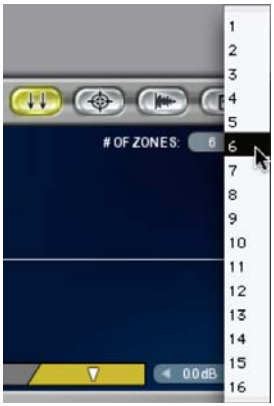
You can increase or decrease the vertical zoom of the waveform in the Waveform display by clicking on the waveform and dragging up or down.

of Zones

The # of Zones pop-up menu lets you select the number of Velocity Zones into which you can load samples. Use multiple Zones to load samples of different dynamics, but use only as many Velocity Zones as necessary to layer dynamically differentiated samples for play back at varying velocities. For example, using four Zones, you can load in, from left (quiet) to right (loud), a *p* snare sample, an *mf* snare sample, a *f* snare sample, and an *ff* snare sample. During playback, each Zone is triggered only by the corresponding amplitude of the detected transient so that a soft hit on the original snare track triggers the *p* snare sample and a loud snare hit triggers the *f* or *ff* snare sample.

When using only one or a just a few Velocity Zones, you may want to use the Dynamics control to affect the playback velocity by the detected amplitude on the original drum track. The Dynamics slider controls the amplitude (velocity) of the triggered sample relative to the original detected amplitude. When a more natural sounding drum track is desired, using multiple Velocity Zones more closely models the sound of acoustic drums at different dynamic levels. For more information on the Dynamics control, see "Playback Controls" on page 36.

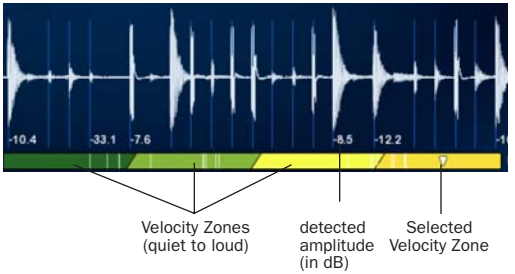
TL Drum Rehab lets you have up to 16 Velocity Zones, and up to 4 Clips (samples) per Zone. Using slightly different sounds on multiple Clips per Zone adds a greater degree of realism by adding variety to the sound (see “Clips” on page 43).



Selecting the number of Velocity Zones

Velocity Map and Velocity Zones

The Velocity Map, below the Waveform display, graphically represents playback amplitude of the track audio against the specified Velocity Zones. TL Drum Rehab translates the detected amplitudes to MIDI velocity for sample playback. When the detected amplitude of trigger is in the range of a particular Velocity Zone, the sample loaded into that Zone is played back (triggered).



Velocity Zones in the Velocity Map

The Velocity Map displays the current velocity (amplitude) on playback. The Velocity Zones are depicted as colored bars in the Velocity Map. The different colors from left to loud (quiet to loud) indicate the velocity range: darker colors represent lower velocity ranges (for example, 1–32) and brighter represent higher velocity ranges (for example, 95–127). Velocity Zones trigger samples within the amplitude range of the Minimum and Maximum Threshold settings (see “Minimum and Maximum Threshold Controls” on page 36.

Use the Velocity Map to select a Zone for loading a sample and also to adjust the crossfade between Zones. Using multiple Velocity Zones lets you layer samples by dynamics for more realistic drum sample playback. Use the left-most Zone for the quietest (*pianissimo*) samples, use the right-most for the loudest (*fortissimo*). Up to four samples (Clips) can be added to each Zone, to give playback a more human and natural quality. (For more information on using multiple clips per Zone, see “Clips” on page 43).

To load a sample into a Zone:

1 Click the Zone in the Velocity Map where you want to load a sample. The selected Zone is indicated by a white triangle.

2 In the Library browser (located to right of the Main window), navigate to the audio file you want to load (a WAV, AIF, or SD2 file, *not* a DRP file).

3 Double-click the audio file (WAV, AIF, or SD2) you want to load into the selected Zone.

⚠ *DRP files cannot be loaded into a Zone. DRP files contain multiple sample with fixed Zone and Clip assignments. Once you load samples into Zones and Clips, you can save them all together as a DRP file.*

For a workflow example of loading samples into Zones, see "Loading Samples and Saving Custom DRP Files" on page 48.

In most simple TL Drum Rehab applications, you may only need to load a single sample into a single Zone. However, for nuanced and dynamic sounds, you can use up to 16 Zones for dynamically layered samples.

To adjust the crossfade between Zones:

■ To change the location of the crossfade between Zones, click the border between Zones and drag it left or right. This determines the range in which the detected amplitude of the original track triggers (plays back) the sample loaded into the Zone.

Adjusting the location of the crossfade between Velocity Zones

■ To change the range of the crossfade between Zones, click the border between Zones and drag it up or down. This determines the range of the crossfade between samples loaded into adjacent Zones.

Adjusting the range of the crossfade between Velocity Zones

Minimum and Maximum Threshold Controls

Adjust the Minimum and Maximum Threshold controls to determine the minimum and maximum amplitudes for detecting triggers. The Minimum Threshold control is to the left of the Velocity Map and the Maximum Threshold control is to the right. The Minimum Threshold control is useful for filtering out bleed through hits (like the snare bleed through on a kick track) so that you only get the triggers you want.

The Minimum and Maximum Threshold controls also set the amplitude range within which Velocity Zones trigger samples.

Triggering Controls

Listen Enable the Listen button to "listen" for triggers in TL Drum Rehab. When Listen is disabled, TL Drum Rehab only plays back Committed triggers (see "Commit" on page 39). For most uses of TL Drum Rehab, Listen is enabled.

No Latency Enable the No Latency button to play back committed triggers with 0 samples of latency. No Latency mode ensures sample accurate drum replacement. This is useful when Delay Compensation is disabled in Pro Tools (Options > Delay Compensation), or for use with Pro Tools LE or lower versions of Pro Tools that do not provide Delay Compensation. When No Latency mode is enabled, only committed triggers play back and Listen is deactivated.

Playback Controls

The Trigger panel provides global playback controls for input gain (track audio), sample playback gain, ducking, dynamics, and A/B blend. All playback controls can be automated.

Input Controls the playback gain of the source track audio. This is like a Dry Mix control. The range of the Input control is between –40 dB and +20 dB.

Samples Controls the playback gain of samples loaded into Velocity Zones. This is like a Wet Mix control. The range of the Samples control is between –40 dB and +20 dB.

Ducking Controls the amount of gain reduction applied to the input audio when a sample is triggered. This is like a balance control, letting you adjust exactly how much the track's audio is suppressed by the samples triggered by TL Drum Rehab. The range of the Ducking control is between –40 dB and 0 dB.

Dynamics Controls the dynamic response of sample playback and scales the playback velocity of the triggered sample to the detected amplitude of the audio on the track. The range of the Dynamics control is between 1% and 100%. When the Dynamics control is all the way to the left, it is off and samples play back at their original amplitude with no gain scaling. The Dynamics control is especially useful if you are triggering a single sample or only a few Zones, but you want more dynamic response on playback than the number of Zones and loaded samples provide.

A/B Blend Controls the mix between samples loaded into Positions A and B in the Samples panel (see "Position A/B" on page 43). For example, Position A could have one center hit snare sample and position B could have another center hit snare sample of a slightly different color. Mixing between the A and B positions helps give triggered samples a fuller sound by blending alternate samples.

Expert Panel Display and Controls

The Expert panel lets you commit, uncommit, or ignore specific triggers for sample playback, as well as quantize committed triggers and edit the location of committed triggers. Playback must be stopped to commit, uncommit, ignore, or otherwise edit triggers.

The Expert panel also provides some of the same controls as the Trigger panel: Listen, No Latency, Minimum and Maximum Threshold, and the Velocity Map and Velocity Zones.

To access the Expert panel:

- Click the Expert Panel button (see Figure 3).

Figure 3. Expert panel

Commit

Commit lets you *commit* specific triggers for sample playback. Committed triggers play back regardless of whether or not Listen is enabled. If Listen is enabled, all detected triggers play back. If Listen is disabled, only committed triggers play back. Committing triggers with Listen enabled is useful for making sure that specific triggers are always at the desired location—for example, with sounds that do not have clear attack transients, you can commit and move the detected trigger to the desired location. Committing triggers with Listen disabled is useful for playing back only the committed triggers—for example, when using TL Drum Rehab on a track with a recording of an entire drum kit, you may want to only enhance the kick drum sound.

To commit detected triggers:

1 Listen for triggers (see "Triggering Controls" on page 36).

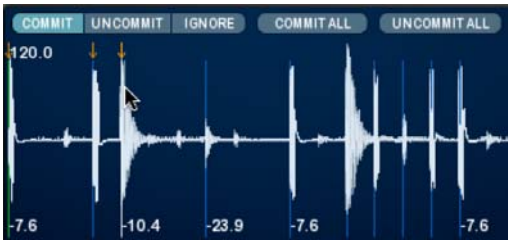
2 Select the Expert panel.

3 Do one of the following:

- Click Commit All to commit all detected triggers.

– or –

- Click Commit and then click only the triggers you want to commit. Committed triggers are indicated by a red arrow.



Committing specific detected triggers

To play back only committed triggers:

1 Deselect Listen.

2 Start playback.

To edit the position of a committed trigger:

1 In the Expert or Trigger panels, click and hold the trigger you want to move. The waveform display zooms to the sample level centered around the selected trigger.

Editing the location of a committed trigger

2 While still holding down the mouse, move the trigger left or right until it is at the desired location.

3 Release the mouse.

If you have already selected replacement samples to be triggered, the waveform of the replacement sample is displayed in green over the track audio waveform (which is white).

Editing the location of a committed trigger, replacement sample waveform displayed in green

To change the amplitude of a committed trigger:

- Control-click (Windows) or Command-click (Mac) and drag the trigger left to lower its amplitude or right to increase its amplitude.

Uncommit

Uncommit lets you uncommit triggers that are currently committed. This can be useful for simplifying a recorded part (you can uncommit triggers for a more sparse kick track), and in cases when the Minimum and Maximum Threshold controls aren't able to filter out all the undesired triggers. For example, if TL Drum Rehab detects erroneous triggers from bleed though, such as the floor tom sounding on the kick track, you can Commit All triggers to be sure you get all the kick drum hits, and then manually Uncommit all the triggers generated by the floor tom.

To uncommit triggers, do one of the following:

- In the Expert panel, click Uncommit All to uncommit all triggers.

– or –

- Click Uncommit and click only the triggers you want to uncommit.

Ignore

When Listen is enabled, Ignore lets you specify detected triggers to be ignored during playback. Triggers do not have to be committed to be ignored.

To ignore specific triggers during playback when Listen is enabled:

1. In the Expert panel, click ignore.
2. Click only the triggers you want to ignore.

Triggers that are ignored are marked with a red X.

Ignoring specific detected triggers

Commit All

Clicking Commit All commits all detected triggers in the Timeline selection.

Uncommit All

Clicking Uncommit All uncommits all detected triggers in the Timeline selection.

Add

Clicking Add analyzes the amplitude of the audio signal at the sample location of the Pro Tools playback cursor and adds a new trigger with a velocity based on that analysis at that location. You can use the Add command to add a trigger during playback or at the current playback cursor location when playback is stopped. If you have a timeline (playback) selection, the Add button is greyed out and unavailable.

While the playback is stopped, use the Pro Tools Tab To Transients feature to locate the desired trigger location, or zoom to the sample level to place the cursor at the precise sample location where you want to add a trigger.

Undo

If you clicked a trigger that you did not want to commit, uncommit, or ignore, click Undo in the Expert panel. TL Drum Rehab supports multiple undos.

Quantize To

Use the Quantize To pop-up menu to select the quantize grid value. The Quantize To pop-up menu lets you select a quantize grid of 1/2, 1/4, 1/8, 1/16, 1/32, or 1/64 notes.

Selecting Quantize To value

Accurate quantization requires an accurate Tempo map and Bar|Beat grid. For more information on using the Tempo map and Bar|Beat grid, see the Pro Tools Reference Guide.

Quantize

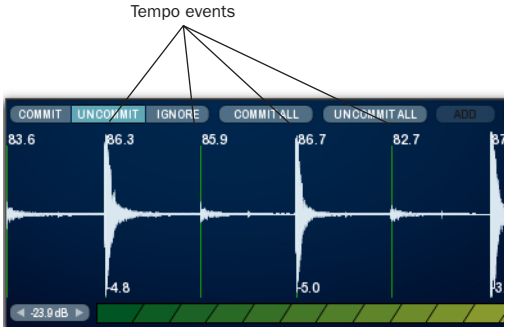
The Quantize slider adjust the amount (from 0% to 100%) that committed triggers are quantized to the selected Quantize To value. Quantizing committed triggers is useful for tightening up a sloppy performance, as well as an effect to get a drum machine–like sound.

Playback Controls

The Expert panel provides the same playback controls as the Trigger panel: Input, Sample, Ducking, Dynamics, and A/B Blend. See "Playback Controls" on page 36).

Waveform Display

The Waveform display in the Expert panel is the same as in the Trigger panel (see "Waveform Display" on page 34), it provides a graphic representation of the selected track's audio, and also displays detected triggers and velocities (amplitudes). Detected triggers are displayed as light blue lines on the waveform. If the Tempo Changes preference is enabled (see "Tempo Changes" on page 45), the Waveform display in the Expert panel also shows Pro Tools Tempo events as green lines with the tempo indicated at the top of the display.



Waveform display in Expert mode with detected triggers and amplitudes, and Tempo events

Velocity Map

In the Samples panel, the Velocity Map functions the same as in the Trigger panel (see "Velocity Map and Velocity Zones" on page 35).

Samples Panel Display and Controls

The Samples panel lets you load, view, shape, and organize samples for playback.

To access the Samples panel:

- Click the Samples Panel button (see Figure 4).

Figure 4. Samples panel

Position A/B

The Position A and B button lets you store samples in two different sets of Zones and Clips. The mix between Positions A and B can be controlled during playback using the A/B Blend slider in the Trigger, Expert, or Samples panels. For example, Position A could have a center hit snare sample and position B could have an off-center hit snare sample. Mixing between the A and B positions helps give triggered samples a fuller sound by blending between alternate samples. The A/B Blend control can be automated to vary the mix between Position A and Position B over time.

Clips

In the Samples panel, TL Drum Rehab lets you load up to four samples per Velocity Zone using Clips 1, 2, 3, and 4. Use the Clip Playback Mode pop-up menu to select whether the Clips are triggered in sequential order (Cycle) or in random order (Random). Using slightly different sounds on multiple Clips per Zone adds a greater degree of realism by adding variety to the sound. For example, you might want to load samples of the same drum played with slightly different stick positions into Clips 1–4 and have TL Drum Rehab trigger them in random order for a more realistic sounding "performance."

To add a sample to a Clip:

1 In the Samples panel, select the Velocity Zone to which you want to add a sample.

2 Click the desired Clip: 1, 2, 3, or 4. In order to select a Clip, there must be a sample already loaded into the preceding clip.

3 In the Library browser (located to right of the Main window), double-click the sample (WAV, AIF, or SD2) you want to add. TL Drum Rehab loads the sample into the selected Clip for the selected Zone.

4 Repeat steps 2–3 as desired.

5 From the Clip Playback Mode pop-up menu, select Cycle or Random to determine whether the clips playback in sequence or in random order.

Selecting the Clip Playback mode

DRP Name Display

The DRP Name display displays the name of currently loaded DRP file above the Waveform display in the Samples panel. This is the same as in the Trigger panel (see "DRP Name Display" on page 33).

of Zones

The # of Zones pop-up menu lets you select the number of Velocity Zones into which you can load samples. TL Drum Rehab lets you have up to 16 Velocity Zones. This is the same as in the Trigger panel (see "# of Zones" on page 34).

Play

In the Samples panel, click Play to audition the currently loaded sample for the selected Zone and Clip.

Clear

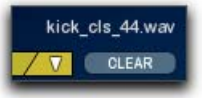
In the Samples panel, click Clear to clear the currently loaded sample for the selected Zone and Clip.

Velocity Map

In the Samples panel, the Velocity Map functions the same as in the Trigger panel (see "Velocity Map and Velocity Zones" on page 35).

Sample Name Display

The Sample Name display displays the name of the sample currently loaded into the selected Zone and Clip is displayed right above the Clear button.



Sample Name display

Invert

In the Samples panel, click Invert to invert the phase of all Clips in the currently selected position (A or B). Invert can be useful for ensuring phase alignment with other drum tracks in the session. It can also be used for shaping the tone of drum sounds—a classic analog technique.

Waveshaping Controls

Use the envelope and EQ controls to shape the sound for all clips in the currently selected position (A or B).

Attack Emphasizes or reduces the attack characteristics of all clips in the currently selected position (A or B). The Attack slider has a range of –100% to +100%.

Sustain Emphasizes or reduces the sustain characteristics of all clips in the currently selected position (A or B). The Sustain slider has a range of –100% to +100%.

EQ Gain Applies a peaking or dipping EQ to all clips in the current position (A or B). The EQ Gain slider has a range of –15 dB to +15 dB.

Freq Adjusts the frequency of the EQ for all clips in the current position (A or B). The EQ Gain slider has a range of 10 Hz to 15 kHz.

Q Adjusts the Q of the EQ for all clips in the current position (A or B). The Q slider has a range of 0.1 to 6.0.

Preferences Panel Display and Controls

The Preferences panel lets you set the preferences for TL Drum Rehab. In most cases the default preference settings do not need to be changed.

To access the Preferences panel:

- Click the Preferences Panel button (see Figure 5).

Timeline Buffer Size

The Timeline Buffer Size determines the amount of RAM allocated for the Waveform display. If you are using TL Drum Rehab on large selections, you may want to increase the Timeline Buffer Size.

Auto-Scroll Time

When there is no Timeline selection in Pro Tools, the Auto-Scroll Time preference sets the amount of time displayed in TL Drum Rehab's Waveform display during playback. During playback, the Waveform display scrolls incrementally by the amount of time specified in the Auto-Scroll Time preference.

Tempo Changes

When the Tempo Changes preference is set to Show, TL Drum Rehab shows Pro Tools Tempo events as green lines with the tempo indicated at the top of the Waveform display in the Expert panel (see "Waveform Display" on page 41). This preference is set to Hide by default.

Figure 5. Preferences panel

TL Drum Rehab Library Browser

TL Drum Rehab provides a Library browser for finding and organizing your library of DRP files and drum samples. TL Drum Rehab includes a library of professionally recorded DRP files (drum samples) tailored specifically for use with TL Drum Rehab.

Library browser

In addition to using the samples that come with TL Drum Rehab, you can also import your own samples and save your own custom DRP files (see "Loading Samples and Saving Custom DRP Files" on page 48).

Library

Click the Library button to view TL Drum Rehab's Library of DRP files. To navigate through multiple directories, double-click folders and use the Up arrow to go up one directory level. You can also use the disclosure triangles to show or hide the contents of a folder.

All of the files available to the TL Drum Rehab library are stored in the following locations:

Windows <system drive letter>:\Documents and Settings\<user name>\Application Data\Trillium Lane\TL Drum Rehab\Samples

Mac /Library/Application Support/Trillium Lane/TL Drum Rehab/Samples

Favorites

Click the Favorites button to show your favorite drum samples and folders of drum samples. For information on Favorites, see "Edit" on page 47.

File

Use the File pop-up menu to navigate to directories and files, and to save DRP files.

Save New DRP File Saves all audio files currently loaded into Clips and Zones as a new DRP file.

Save DRP File Saves any edits to the currently loaded DRP file.

Show All Volumes Displays all volumes (drives) in the Library browser. The Show All Volumes command retains the last finder view and location.

Refresh All Volumes Searches for newly mounted volumes (such as sample CDs). It also clears the most recent finder search location, and returns the browser to the root level view.

Edit

Use the Edit pop-up menu to Add or Remove Favorites, and organize your Favorites in folders.

Add To Favorites Adds the currently selected DRP file or folder to the Favorites folder.

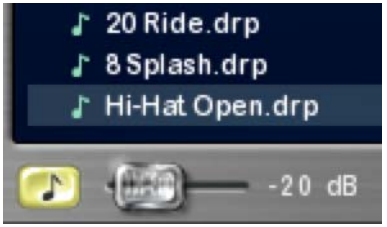
Remove From Favorites Removes the currently selected DRP file or folder from the Favorites folder.

New Favorites Folder Creates a new folder in the Favorites folder.

Rename Favorites Folder Lets you rename the selected Favorites folder.

Auto-Audition

Enable Auto-Audition to hear drum samples in the Library browser automatically when you click them. Use the slider to adjust the audition volume.



Auto-Audition

Help

The Help button at the top of the Main window turns TL Drum Rehab Help Balloons on or off.

TL Drum Rehab Help Balloons

Loading Samples and Saving Custom DRP Files

In addition to using the DRP files that come with TL Drum Rehab, TL Drum Rehab lets you load your own samples and save custom DRP files. While you can load samples in both the Trigger and Expert panels, the Samples panel provides the most extensive features for loading samples and saving custom DRP files. The following example describes loading several snare samples layered by dynamics and then saving them as a custom DRP file.

Workflow Example

Loading samples and saving a custom DRP file:

1 Insert TL Drum Rehab on a mono audio track.

2 In the Library browser, select File > Show All Volumes. The Library browser displays the root level of your computer.

3 Navigate to the directory where the snare samples are located. Double-click a volume or directory to open it in the Library browser, or click the disclosure triangle to the left of the volume or directory name to reveal its contents.

If you want to import samples from a CD, and you don't see the CD you may have just inserted, select File > Refresh All Volumes.

4 To audition a file before importing it, enabled Auto-Audition and click the sample name in the Library browser.

5 Select the Samples panel (see "Samples Panel Display and Controls" on page 42).

6 Select the desired number of Zones from the # Of Zones pop-up menu. This example uses 6 Zones for 6 samples of a snare hit all recorded at different dynamics from *p* to *fff*. (See "# of Zones" on page 43.)

7 Select the Zone into which you want to load the first sample. In this example the samples will be loaded from soft to loud, so select the left-most Zone first. (See "Velocity Map and Velocity Zones" on page 35.)

8 In the Library browser, double-click the desired audio file (WAV, AIF, or SD2) to load it into the selected Zone.

9 Repeat steps 7 and 8 for each new sample until all the samples have been loaded into the corresponding Velocity Zones.

For more variety of sound, you can load more samples into as many as four Clips per Zone. (See "Clips" on page 43.)

10 Click the Play button to audition the sample loaded into the currently selected Zone and adjust the Waveshaping controls and other Samples panel parameters until you get the sound you want.

11 In the Library browser, navigate to the directory where you want to save the loaded samples as a new DRP file.

TL Drum Rehab provides a User DRPs directory in the Library for storing your custom DRP files.

12 Select File > Save New DRP File. The new DRP file appears highlighted at the top of the browser list as "Drum Samples.drp."

13 Click and rename the file to something identifiable. In this example, the samples were recordings of a Noble and Cooley snare, so it is named "NC Snare 1."

14 Press Enter (if you do not press Enter, the new DRP will not be saved). The new DRP file appears in the current directory.

15 Select the new DRP file in the Library browser and choose Edit > Add To Favorites to readily access to the new DRP file in the future.

chapter 7

TL EveryPhase

Introduction

TL EveryPhase is a TDM and RTAS 18-stage analog modeled phaser effects plug-in designed to reproduce classic phaser effects as well as creating exciting new sounds.

How a Phaser Works

Traditional Analog Phasers

The phaser (or phase shifter) is a classic sound effect often heard on guitars or synthesizers. The sweeping sound of a phaser can vary from subtle modulation and tremolo on a delicate guitar track to the most extreme filtered feedBack. Traditionally, phasers were analog effects devices.

Analog phasers delivered the benefits of a smooth analog sound, but like many analog devices were often unreliable and introduced unwanted noise and hum.

A phaser functions by moving a portion of the incoming audio out of phase and then adding the processed audio back to the original signal. Each stage of a multiple stage phaser can be thought of as a narrow band or notch of the frequency range which is filtered out. As the frequency is adjusted, the classic sweeping phaser sound is heard.

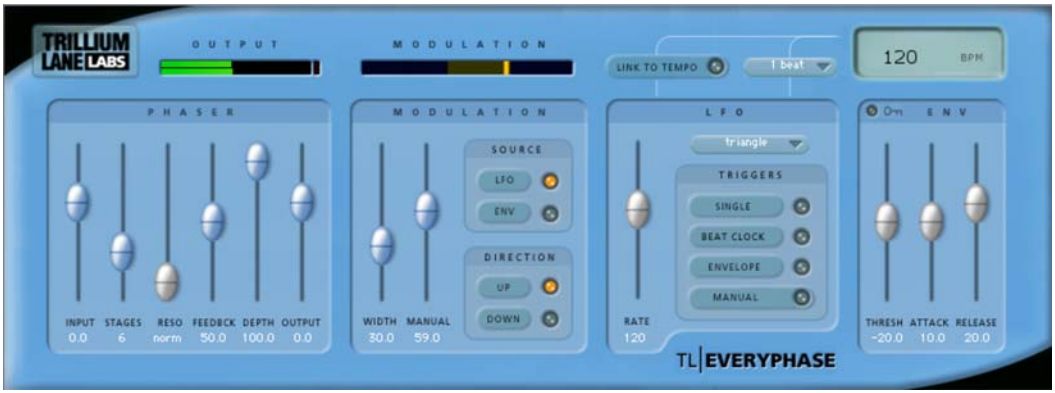


Figure 1. TL EveryPhase plug-in

TL EveryPhase

TL EveryPhase uses proprietary DSP algorithms to deliver the classic analog phaser sound in digital form, with the added benefits of extensive synchronization and automation options. Figure 2 shows the different modules of TL EveryPhase and how they interact with the audio signal.

The modulation of the phaser algorithm in TL EveryPhase can be controlled by a low frequency oscillator (LFO) or by the envelope of an audio signal using the built-in envelope detector. The Depth control switches TL EveryPhase between phasing in opposite and identical phasing modes, and feedBack can be taken from any stage of the phaser by adjusting the Resonance control.

TL EveryPhase provides controls to enable the LFO to be synchronized to the current tempo of the Pro Tools session. A variety of LFO triggers are also provided to ensure that a phase effect can be created to match the timing of any audio signal.

The envelope detector in TL EveryPhase provides several options to control the phasing directly from an audio signal. Firstly, the envelope detector can be driven by the audio of the current track or audio from a side-chain input. The envelope detector can drive the phaser modulation directly by selecting ENV for the Source in the Modulation section. Alternatively the envelope detector can be used as a trigger for the LFO by selecting Envelope under Triggers in the LFO section.

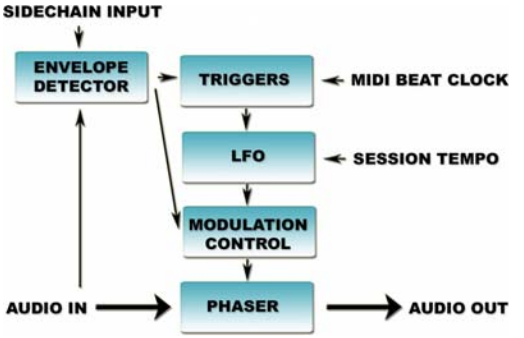


Figure 2. TL EveryPhase signal flow, processing, and controls

TL EveryPhase Controls

The TL EveryPhase interface is divided into several sections, each of which is described below.

Meter Section

Output and Modulation meters

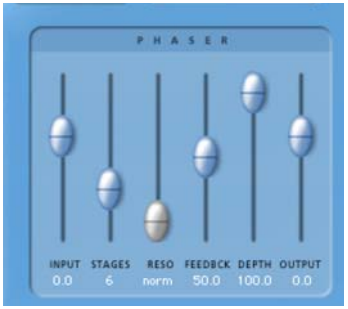
Output

The Output meter displays the amplitude of the outgoing audio. In mono mode, a single meter bar is shown. In mono to stereo and stereo modes, two meter bars are shown with the left channel at the top of the meter display. In 5.1 mode, six channels are shown, in the order L C R Ls Rs LFE from the top of the meter display. The red clip indicator indicates a channel has clipped. The clip indicator for each channel can be cleared by clicking on it.

Modulation

The Modulation meter displays several items at once. First, the range of phaser sweep set by the Modulation Width and Manual controls is indicated by the shaded background area. The movement of the phaser itself is indicated by one or two scanning bars. When TL EveryPhase is instantiated on a mono, stereo, or 5.1 track, a single bar is shown in this meter. When instantiated on a mono track as a mono to stereo plug-in, two scanning bars are shown.

Phaser Section



Phaser section

Input

The Input slider lets you cut or boost of the input signal level from –24 dB to +12 dB.

Stages

The Stages slider sets number of phaser stages from 2 to 18. This changes the character of the sound as the number of stages controls the number of notches that TL EveryPhase affects.

Resonance

The Resonance slider changes the character of the feedBack tone created by allowing the feedBack to come from a different stage of the phaser. When Resonance is set to Norm, feedBack is based on the stage of the phaser set by the Stages slider. When Resonance set to any other value, feedBack is taken from the stage indicated by the Resonance slider and a different feedBack tone is created.

FeedBack

The FeedBack slider feeds the output signal of TL EveryPhase back into the input, creating a resonant or singing tone in the phaser when set to maximum.

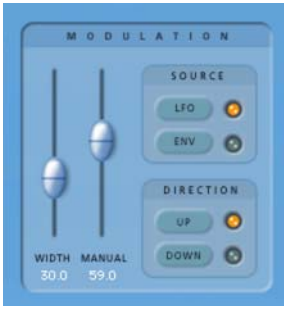
Depth

The Depth slider adjusts the depth of the notches in the phased signal. When set to zero, TL EveryPhase does not phase the audio signal. Depth can be set to positive or negative values which allows for two separate types of phasing to occur. When Depth is positive, the notches occur at frequencies that are at opposite phase, which is a common feature of many analog phasers. When Depth is negative, the notches occur at frequencies that have identical phase. The sound quality of these two types of phasing can be remarkably different.

Output

The Output slider lets you cut or boost of the output signal level from –24 dB to +12 dB.

Modulation Section



Modulation section

Width

The Width slider determines the amplitude of the modulation sweep. This is displayed graphically in the modulation meter.

Manual

The Manual slider offsets the modulation sweep. This is displayed graphically in the modulation meter.

Source

Click LFO or ENV to select the source for modulation. When the Source is set to LFO, modulation is controlled by the LFO. When it is set to Envelope (ENV), modulation is controlled by the Envelope Detector which listens to the audio signal. If the side-chain input in the Envelope section is activated, the side-chain audio is used instead of the current track.

Direction

Click Up or Down to change the direction of the modulation.

LFO Section

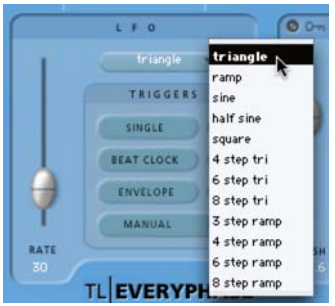
LFO section

> ⚠ *When the Modulation section's Source is set to the Envelope (ENV), the controls in the LFO section have no effect on the current sound.*

Rate

The Rate slider adjust the rate of the LFO in beats per minute. When Link to Tempo is activated, the slider is ignored and the LCD always displays the current session tempo.

Waveform



Selecting the LFO Waveform

The Waveform selector (Triangle, Ramp, Sine, etc.) determines the wave shape used by the LFO. The waveform shape in use is graphically depicted by the movement of the scanning bars in the Modulation meter.

LFO Triggers

LFO Triggers

By default, the LFO cycles continuously through the selected waveform. The LFO can be set to cycle through the selected waveform just once, or it can be triggered by MIDI Beat Clock, the Envelope, or manually.

Single

When the Single trigger is selected, the LFO will cycle thru the waveform once only and then stop.

Beat Clock

When the Beat Clock trigger is selected, the LFO synchronizes to MIDI Beat Clock. TL EveryPhase receives Beat Clock signal every 64th-note. The Duration menu determines how often the Beat Clock signal triggers TL EveryPhase, ranging from every 16th-note to every 4 bars. When Beat Clock signal is received, the Beat Clock trigger light blinks brightly. Using the Beat Clock function enables TL EveryPhase to produce consistent phasing results, ensuring that the LFO is always in the same state at each beat.

In Pro Tools 6.1 and earlier, MIDI Beat Clock be enabled in Pro Tools. Select MIDI > MIDI Beat Clock, and enable MIDI Beat Clock and select TL EveryPhase as a destination.

Envelope

When the Envelope trigger is selected, the LFO is triggered directly by the Envelope detector, which listens to the audio signal. If the Side-Chain Input selector in the Envelope section is activated, then the side-chain audio signal is used instead. When activated, the Envelope light blinks brighter when an audio signal is detected. The threshold level can be adjusted using the Threshold control in the Envelope section.

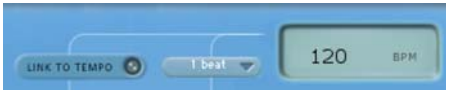
If the Envelope Detector is completely released due to previous portions of the audio signal going above threshold, a trigger occurs the next time the audio goes above the threshold level. Another trigger will not happen until the Envelope Detector has completely released after the audio goes below the specified threshold. Thus, increasing the Release slider will reduce the rate at which triggers can occur and decreasing the Release time increases the rate at which triggers can occur.

Manual

When the Manual trigger is selected, the LFO is triggered manually. This can be especially useful if you want to trigger the LFO using Pro Tools automation.

With control surfaces and automation, the Manual trigger acts like an on/off switch and triggers the LFO every time it changes state.

Tempo Controls



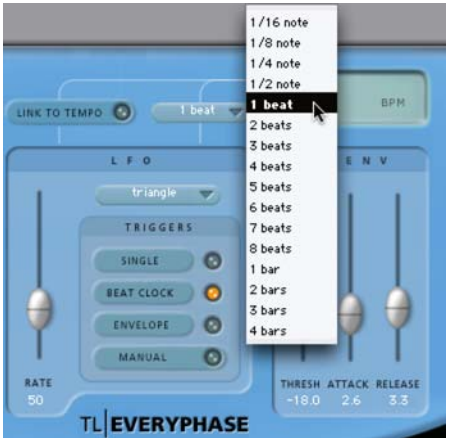
Tempo controls

Link To Tempo

When the Link To Tempo option is enabled, the LFO rate is set to the Pro Tools session tempo, and any tempo changes in the session are followed automatically. When Link To Tempo is enabled, the LFO rate slider is ignored and the tempo displayed in the LCD always displays the current session tempo.

⚠ *The Link To Tempo control is only available on Pro Tools 6.1 and later. In earlier releases of Pro Tools, manually set the LFO rate to match the session tempo for the same effect.*

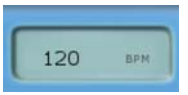
Duration Selector



Selecting Duration

The Duration selector works in conjunction with the session tempo, LFO rate, and Beat Clock trigger. By default, Duration is set to 1 bar. At that setting, the LFO cycles once within one bar. When Duration is set to 1 beat, the LFO cycles within the duration of one beat. When Link to Tempo is activated, the Duration selector sets the LFO rate as a function of the tempo of the Pro Tools session. The Duration selector also controls how often the Beat Clock trigger is activated.

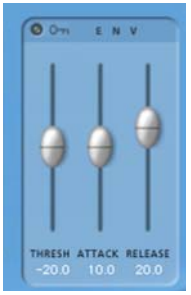
Tempo Display



Tempo Display

The Tempo Display displays the tempo in BPM. The value in the Tempo Display can also be edited directly by clicking it.

Envelope Section



Envelope section

When you select Envelope as the Modulation source, Modulation (as shown in the Modulation Meter) is controlled by the audio signal and the Envelope Detector section controls.

⚠ *When the Envelope Detector is not in use, the controls in this section have no effect on the sound.*

Side-Chain Input

Side-Chain Input selector enabled

When the Side-Chain Input selector (the key icon) is enabled, the audio for the Envelope Detector is taken from the side-chain input rather than the current track. Select the Side-Chain Input using the Pro Tools key icon at the top of the plug-in window.

Threshold

The Threshold slider sets the amplitude level required for the Envelope Detector. The LFO Envelope Detector light blinks brighter when audio is detected above the threshold.

Attack

The Attack slider sets the attack rate of the Envelope Detector.

Release

The Release slider sets the release rate of the Envelope Detector.

Using TL EveryPhase

This section addresses some common scenarios in which TL EveryPhase can be used during a Pro Tools session.

Using Presets

TL EveryPhase ships with a wide selection of factory presets for different phaser sounds. The following should be noted when using presets:

- Presets which use the Envelope Detector may need to have the Envelope Threshold, Attack and Release adjusted appropriately for the current audio signal.
- Some presets utilize the Side-Chain Input. If necessary, ensure that you have a side-chain input assigned, and adjust the Envelope Detector to get the best results.
- Adjust the input and output levels appropriately for your track to avoid clipping.

Creating a Single Phased Sound

A single phased sound (one cycle of the phaser) can be created using automation of the LFO manual trigger.

To create a single phased sound:

1 Insert TL EveryPhase on a track.

2 Select an appropriate LFO Waveform, such as Ramp.

3 Set the Rate to an appropriate value.

4 Enable the LFO Single trigger so the LFO will only cycle once.

5 Select the Auto button at the top of the TL EveryPhase plug-in window.

6 Add LFO Manual Trigger to the automation list.

7 Set the Automation mode for the track to Write or Touch.

8 Play the session

9 At the point where you wish phasing to start, click on Manual Trigger to start the LFO. The automation for this action will be recorded onto the track.

The Bypass and/or Depth controls can also be automated to ensure TL EveryPhase does not effect any part of the sound except the specific section required.

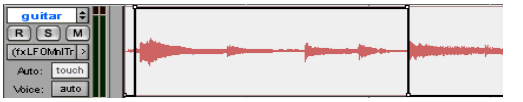
Creating a Gradual Phaser Effect

As an alternative to bypassing TL EveryPhase when an effect isn't needed, the Depth control can be automated to introduce and fade out TL EveryPhase on a track as required.

Manually Automating Triggers

TL EveryPhase offers Beat Clock triggers which allow you to trigger the LFO on bars and beats. If you want the phasing effect of TL EveryPhase to match an irregular sound (such as a guitar lead that doesn't fall on a specific beat), manually automating the LFO Manual Trigger provides an alternative.

You can manually automate the LFO to trigger at specific points in the session in a similar fashion to that described above. The following screenshot shows a guitar track with automation of the LFO Manual Trigger at points which match key phrases in the guitar playing.



LFO Manual Trigger automation on a guitar track

Alternatively, with an appropriate audio signals, using the LFO envelope trigger with the correct threshold settings will trigger the LFO as needed.

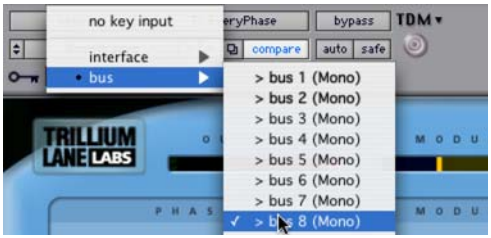
Using the Beat Clock

The Beat Clock trigger lets you trigger the LFO on specific bars and beats. Using the LFO Duration menu and the Beat Clock trigger, you can restart the LFO as often as once every 16th-note.

This is useful when the tempo and timeline in a Pro Tools session have been set to match the music.

Using the Side-Chain Input

The Side-Chain Input option in TL EveryPhase lets you direct audio from another track in your Pro Tools session to the Envelope Detector. This is achieved by sending the audio from the desired channel to a bus and setting the side-chain input on TL EveryPhase to the same bus.

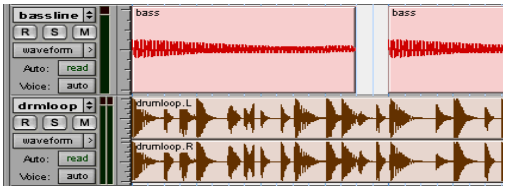


Selecting a bus as the Side-Chain Input

The Side-Chain Input feature lets you control the TL EveryPhase modulation and LFO using external audio sources, allowing you to explore creative possibilities not available with most phasers.

For example, a side-chain input can be used to "listen" to a percussion track and create a rhythmic phasing effect on a bass line. This is especially effective in R&B, hip hop and electronic music.

Consider the following two bar bass line and drum loop. The bass line is simply a single bass guitar note which lasts for almost an entire bar.



Bass line and drum loop tracks

The bass line can be phased by the drum loop as follows:

1 Instantiate TL EveryPhase on the bass line track.

2 Send the drum loop track to a bus.

3 Set the Side-Chain Input on TL EveryPhase to listen to the selected bus.

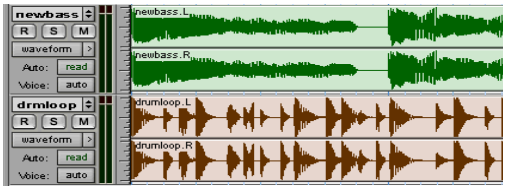
4 Activate the Side-Chain Input in TL EveryPhase by selecting the key icon in the Envelope section.

5 The Side-Chain audio can modulate the audio directly by selecting Source:Envelope in the Modulation section. Alternatively, the Side-Chain Input can be used to trigger the LFO by selecting the Envelope trigger in the LFO section.

6 After starting the transport, adjust the Threshold in the Envelope section until the drum loop is triggering the Envelope Detector. This is shown by the Source:Envelope or Envelope trigger light blinking brighter, as well as shown by the action of the Modulation Meter.

7 The Attack and Decay in the Envelope section can also be adjusted to suit your needs.

The phased bass line is shown below after being recorded to a separate track. The effect of TL EveryPhase triggered by the drum loop can be seen in the resulting waveform.



Resulting phased bass line

⚠ *On versions of Pro Tools prior to 7.0, RTAS plug-ins do not provide side-chain processing when used on TDM systems. Use the TDM version of TL EveryPhase if you require side-chain processing on a TDM system.*

For more information on using the Side-Chain Input, see the DigiRack Plug-ins Guide.

Adding Other Effects

For different phaser sounds, try using a compressor before or after TL EveryPhase. Other useful effect plug-ins to try with TL EveryPhase include distortion, delay, and EQ.

Tweaking TL EveryPhase

Can't get the perfect phaser sound? Try some of these ideas!

- Try a preset. TL EveryPhase includes over 120 presets in eight categories. The categories are merely suggestions - a preset created for guitar may have just the sound you need for vocals.
- Adjust the Depth. Setting Depth to positive or negative values allows for two separate types of phasing to occur. When Depth is positive, the phaser notches occur at frequencies that are at opposite phase, which is a common feature of many analog phasers. When Depth is negative, the notches occur at frequencies that have identical phase. Flipping the Depth from positive to negative or vice versa can have a dramatic impact on the sound.
- Change the Resonance. If you want to modify the 'singing' tones created by high FeedBack settings, try adjusting the Resonance control. By default, the Resonance slider is set to 'Norm' which is equal to the current Stages setting. For example, when using TL EveryPhase with Stages set to 10, setting the Resonance slider at 2, 4, 6, or 8 stages will provide a reduced feedBack tone. Likewise, to increase feedBack tones, set the Resonance slider to a higher setting.
- Some LFO shapes may create transients or 'blips' in the phased sound. This is especially common with the Ramp and Square Wave LFO shapes. To reduce the transient, reduce the FeedBack and Stages settings.

chapter 8

TL InTune

Introduction

TL InTune is a TDM and RTAS professional instrument tuner plug-in. It offers the features and performance of a rack mounted digital tuner in the convenience of a plug-in. TL InTune provides accurate and rapid tuning for a wide range of musical instruments, saving valuable studio time and adding a level of unprecedented convenience for musicians and audio engineers.

To use TL InTune with Pro Tools, simply create a new mono audio or Auxiliary Input track in Pro Tools, and select TL InTune from the plug-in menu for that track.

When TL InTune detects an audio signal from the track, the meter lights up and displays the relative pitch of the incoming signal. With stringed instruments, this will vary during the attack and decay of the note.

By default, TL InTune loads the Chromatic tuner preset. This displays all notes in the scale and automatically displays the required octave.

TL InTune provides a number of factory presets for stringed instruments in alternate tunings. Each factory preset is programmed with the specific notes for each string of the instrument in order to speed the tuning process, as well as making it easier for engineers to generate test tones for musicians to tune with.

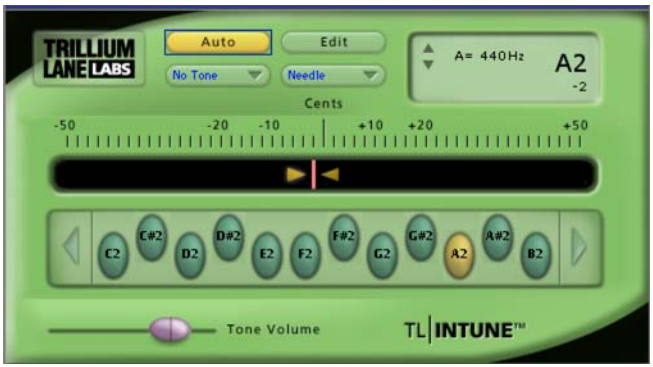


Figure 1. TL InTune plug-in

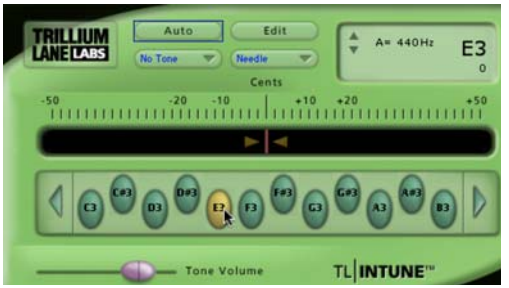
TL InTune Controls and Displays

Automatic Mode

When Automatic mode is active, TL InTune will detect the note played and automatically show the pitch for that note.

To tune to a single note:

- Click the button for the desired note.



Selecting a note

This turns off automatic mode. TL InTune will now display pitch relative to the selected note only.

To enable Automatic mode:

- Click the Auto button to enable Automatic mode. The Auto button highlights.

Test Tone

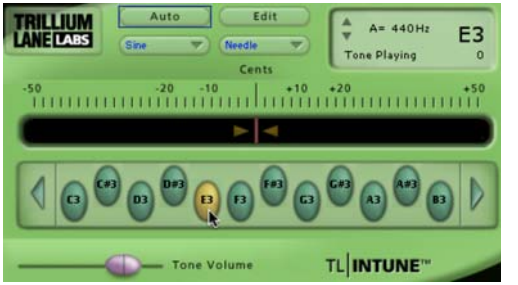
TL InTune will generate both sine wave and triangle wave test tones as shown in the tone menu. The "Audible" tuning tone modulates the input signal against the reference tone.

To hear a test tone:

1 Select Sine, Triangle, or Audible from the Test Tone selector.

Selecting a test tone

2 Click the Note button for the desired note.



Selecting a test tone note

3 Adjust the Tone Volume slider as desired.

When a test tone is playing, "Tone Playing" appears in the information display.

Meter Display

The Meter selector lets you use a standard needle style meter or a strobe style display.

To select the Meter display:

- Select Needle or Strobe from the Meter selector.

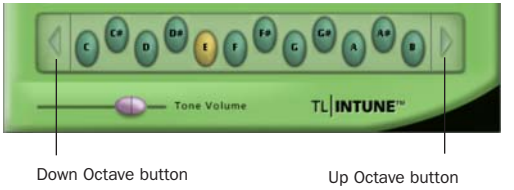
Selecting Meter display, Strobe

Strobe Display

TL InTune, Strobe display

The Strobe display scrolls to the left when the tuned note is flat, and to the right when the tuned note is sharp. When the tuned note is close to the target note, the strobe slows to a stop. The information display shows the exact number of cents sharp or flat from the target note.

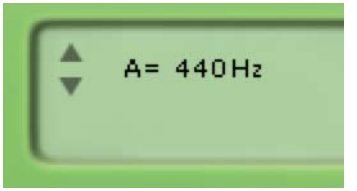
Octave



Octave buttons

The octave range of 0–6 displayed in TL InTune is based on middle C being equal to C4. In chromatic presets, you can select the desired tuning octave from 0–6 using the arrows at each end of the note display.

Reference Frequency



TL InTune, Reference Frequency

You can adjust the tuning reference frequency using the arrows inside the information display. By default, reference frequency is A=440 Hertz.

Information Display

The LCD style information display in TL InTune displays the following:

- The reference frequency
- The current note to which TL InTune is tuning
- The number of cents sharp or flat from the current note
- The status of any test tones playing

Note Selection

The Note Selection buttons provide two functions:

- When in automatic mode, clicking on a note button will turn off automatic mode and TL InTune will now display pitch relative to the selected note only.
- When a tone is selected in the test tone menu, clicking on a note button will play a test tone for that note. Click the note button again to turn off the test tone.

The number of note buttons will depend on the preset selected. The default chromatic preset will display all twelve notes. A preset for a six string guitar will only display six notes.

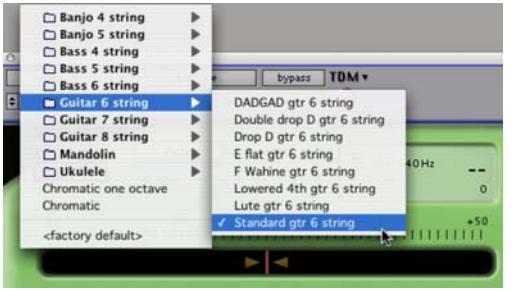
Tone Volume

The Tone Volume slider controls the volume of the test tone audio signal.

Customizing TL InTune

Presets

TL InTune provides a selection of factory presets for stringed instruments. These presets can be selected from the Plug-in Librarian menu.



Selecting a TL InTune preset

To make any preset the default when TL InTune is instantiated:

1 From the Plug-in Librarian menu, select the desired preset.

2 From the Plug-in Settings menu, select Set As User Default.

3 From the Plug-in Settings menu, select Settings Preferences > Set Plug-in Default To > User Setting.

For more information on using the plug-in librarian in Pro Tools, see the DigiRack Plug-ins Guide.

Creating Tuning Presets

TL InTune lets you create customized tuning presets that display note selections for specific instruments and tunings. Once created, these tuning presets can be saved as part of a standard Pro Tools plug-in preset.

From the main TL InTune screen, click the Edit button to display the Tuner Programming screen.

Tuner Programming

Chromatic Mode

When selected, Chromatic mode overrides any custom note selections and displays a 12-note chromatic scale. The note entry fields are disabled when Chromatic Mode is selected.

Single Octave Mode

When selected, Single Octave mode disables the display of octave information with each note on the main TL InTune screen. When tuning in this mode, TL InTune ignores the octave of the note being tuned. The octave information entered in the Edit screen is used only for generating test tones.

Single Octave mode is typically used for instruments which generate harmonics in multiple octaves, such as bass guitars. Because of the low frequency waveform generated by a bass guitar, it is easier for TL InTune to tune to a higher harmonic of the note instead.

Display Flat Semitones

TL InTune will display all semitones entered into note fields as sharp by default. For example, a guitar tuned to E-flat is usually represented by the following.

Eb2, Ab2, Db3, Gb3, Bb3, Eb4

By default, if these notes are entered in the Edit screen, TL InTune will display these same notes in the following way.

D#2, G#2, C#3, F#3, A#3, D#4

The Display Flat Semitones option overrides the default behavior and displays semitones as flats, not sharps. It is not possible to display both sharp and flat semitones in the same tuning preset.

Note Entry Fields

The twelve note entry fields allow entry of individual notes from A0 to G7. Flat semitones are entered with a "b" (for example, Ab2), and sharp semitones are entered with a hash or pound character (for example, A#2). To clear an entry, enter "– –."

Note fields are committed by pressing Return (Macintosh) or Enter (Windows). If you do not press Return or Enter, the note field will return to the previous value entered. TL InTune will automatically justify the note buttons as needed so they fit in the correct area on the main screen.

The Note Entry fields are not available in Chromatic mode.

Exit

In the Tuner Programming screen, click the Exit button to return to the main TL InTune screen.

Using TL InTune

When TL InTune detects a signal, the meter lights up and displays the relative pitch of the incoming signal. With stringed instruments, this will vary during the attack and decay of the note.

In Automatic mode, TL InTune estimates the note to which you are trying to tune. If the correct note is not lit in automatic mode, click on the note to which you are trying to tune for greater accuracy. This will lock TL InTune to the specified note.

The meter will display the frequency of the note detected, and the accuracy is displayed on a scale of plus/minus 50 cents. In addition, the information display will display the note and the number of cents from perfect tuning.

When loading factory presets, stringed instruments are laid out from the highest numbered string (usually the lowest tone) to the highest, from left to right. For example, a six string guitar in standard tuning is shown as E2, A2, D3, G3, B3, E4, which are the notes and octaves for the sixth string through to the first string respectively.

For best tuning results with guitars, do the following:

- Use headphones, as loud monitors can modulate the guitar string.
- Switch your guitar to its rhythm (neck) pickup, if it has one.
- Roll your guitar's tone knobs all the way off to remove all the highs.
- Pluck the open string right over the twelfth fret, not over the pickup.

To produce convenient test tones, select the appropriate preset from the Librarian menu and select an appropriate test tone from the Test Tone menu. Click on the desired Note button to produce the appropriate test tone. Test tones can be routed to headphones as required for musicians during session.

chapter 9

TL MasterMeter

Introduction

TL MasterMeter is a TDM and RTAS oversampling meter plug-in that is designed for critical mixing and mastering applications.

Figure 1. TL MasterMeter plug-in

Understanding Digital Distortion

Clients in the music industry regularly demand the loudest possible mixes. In the process of achieving such a "hot mix," unwanted distortion can be introduced. Intersample peaks that exceed 0 dB may play without distortion in a studio environment, but when the same mix is played through a consumer CD player, the digital to analog conversion and oversampling process can reproduce a distorted mix.

Digital Audio Theory

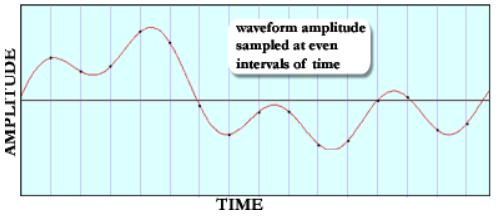


Figure 2. Sampling

A key observation in digital audio theory is that the entire waveform is represented by the sampling points, but a reconstruction process still needs to occur in order to recreate the waveform represented. One cannot simply "connect the dots" between sample points (as shown in Figure 2) and yield the original waveform.

A waveform can be represented in multiple ways during the process of sampling, display and reconstruction. Figure 3 through Figure 6 show how the same complex waveform in Figure 2 can be represented in the digital domain.

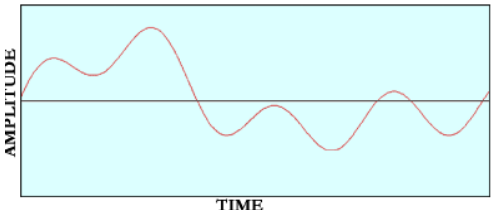


Figure 3. A complex waveform

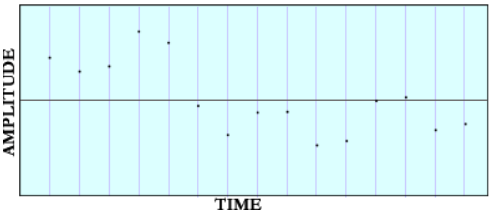


Figure 4. Waveform sampled

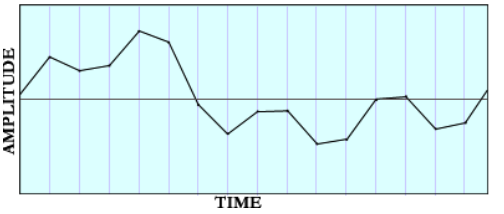


Figure 5. Waveform as represented in DAW

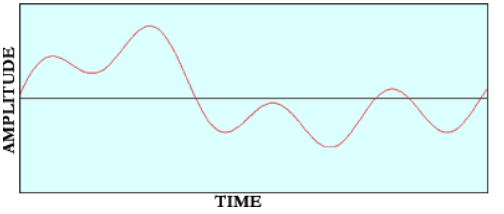


Figure 6. Waveform as reconstructed at the D/A

The process of recreating the original waveform from the sampled waveform involves a filter called a reconstruction filter. This filter removes all content above the Nyquist frequency (half the sample rate). The range below the Nyquist frequency defines the "legal" range of allowed frequencies as frequencies in this range can be accurately reproduced. All frequencies above the Nyquist frequency do not adhere to Nyquist or Shannon's theorems regarding allowable frequencies, cannot be reproduced and are therefore considered "illegal" frequencies. Because of mathematical realities observed by Fourier in the 1800's and subsequently by Shannon in

1948, when a waveform has all frequencies removed above the Nyquist frequency, the resulting waveform will be the original waveform that was sampled.

This process is significantly more involved than simply "connecting the dots" between sample points. Today it involves extremely sophisticated means of reconstructing the waveform, using filters that are highly complex mathematical systems utilizing "oversampling," "upsampling," "linear phase, equiripple FIR" designs and much more.

Oversampling creates a more accurate digital representation of an analog signal by sampling some number of times per second (frequency) and converting into digital form. Oversampling requires at least twice the bandwidth of the frequency being sampled. For example, a consumer CD player using 2x oversampling is processing information at 88.2 kHz.

The result is that today's digital to analog converters get closer to the original than ever before, making music played on systems today as accurate as possible. Even today's inexpensive components such as off-the-shelf CD players have drastically improved filters and thus better reconstruction abilities than in years past.

Application

Most contemporary audio recording is done with Digital Audio Workstations (DAWs), although digital mixing systems in the form of outboard digital mixers are also very popular. To the user, these digital systems appear similar to traditional audio tools and are designed order to emulate the operation of a conventional analog recording system.

One familiar analog tool that has been carried over to the digital realm is a "peak meter" that tells the amplitude of the waveform's peaks. In the analog realm, peak signal was an indicator that would alert the audio engineer when the peak signal level was getting too high. A peak signal in analog recording would cause the tape to saturate, creating distortion. In an analog system however, this type of distortion was often deliberately engineered into tracks in order to achieve a certain sound.

In the digital realm this type of meter is important and more vital, because if the amplitude of a waveform exceeds the top of the measurable scale (full scale, or "full code"), the signal will "clip" causing unwanted and unpleasant distortion rather than the traditional distorted sound of analog. This digital clipping occurs because the waveform is "lopped off" and the data is changed. When the waveform is reconstructed it cannot be accurately done in order to represent the original waveform. Instead, it has a significant amount of inharmonic distortion caused by aliasing. For this reason, digital recording has a maximum level at which signals can be recorded. Anything exceeding this level (full scale) has undesirable consequences.

The method used for computing the peak value inside the system however is not particularly accurate. DAW systems typically take the amplitude of the samples and use these as the basis for the peak meter. The problem with this approach is easily identified: the samples themselves do not represent the peak value of the waveform. The waveform is only complete after the reconstruction process. Until this process has been completed, the waveform is inaccurately represented by the samples. This is the reason that in most DAWs the waveform is represented on the screen as a "dot to dot" connection between sample points. They do not undergo the reconstruction process inside the system, so all that

can be represented is the sample points and for the sake of visual ease, they connect the dots between them with straight lines. They save the reconstruction process for the digital to analog converters.

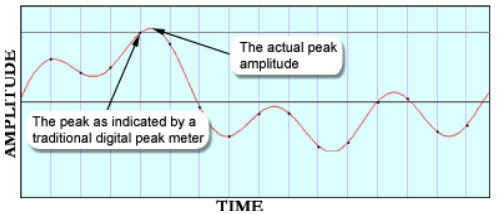


Figure 7. Intersample peaks

The consequence of the way in which DAWs treat waveforms is that the meter inside the DAW or other digital mixers inevitably shows inaccurate information. It is virtually a mathematical certainty that the waveform will exceed the amplitude of the samples in any sampling system. The samples themselves only represent a waveform. It is important to understand that the amplitude of the waveform will invariably exceed the sample values.

Manifestation

Today's recording environment demands that sessions are mixed and mastered as "hot" as is possible, pushing the levels up to the highest tolerable amount, supposedly just short of clipping. Sophisticated digital tools allow music to be highly compressed, then recompressed, compressed even more so with multi-band compressors, limited, normalized, and maximized to get the audio to play as loud as possible out of a consumer's system. Hence, it is very common for popular music CDs to be full of digital samples that are at, or nearly at full scale.

The problem is realized in that while going through these digital gyrations and utilizing digital tools to amplify the signal as much as possible, both during mixing and during mastering, the "peak value" of the sample points is closely watched to ensure that it does not get to full scale. Since the peak meters in said DAW and digital mixing systems are inaccurate, and do not actually indicate the peak values of the resulting waveform, the result is that while the samples themselves do not exceed full scale and are carefully monitored to ensure this, the resulting waveforms represented by the samples may exceed full scale throughout any standard CD!

While the digital mixing system is not clipping the music or distorting the music, the digital to analog converters that have the task of recreating the audio through digital reconstruction filters are clipping repeatedly throughout most CDs on the market. The result is that most CDs and DVDs end up distorting with regularity when they are asked to reconstruct and play back audio that appears to be completely "legal" because not a single sample actually clipped.

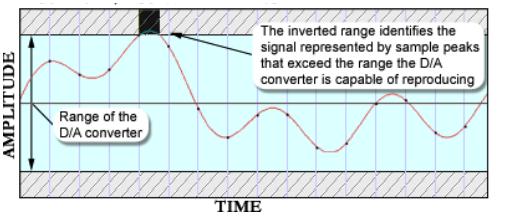


Figure 8. D/A converter range

In a recent paper [Nielsen 2003], seven consumer CD players were subjected to tests designed to analyze their ability to reproduce and reconstruct signal levels above full scale (0 dBFS). All of the players experienced difficultly dealing with signal levels this high, further showing that, while all of the samples can be legal, the level can still be hotter than is legal. The result is that a CD player can be unable to reproduce the audio accurately. In some cases,

the reconstruction sounds "perfect" to the mastering engineer, because the engineer's equipment can actually reproduce the waveforms properly.

The Red Book format for CDs and the DVD specs both allow for this illegal content and the mastering engineer is still allowed to put out releases that meet the spec while allowing consumers' players to distort. With an oversampled peak meter, the engineer will be able to know that the music is clipping, by how much and where. With this knowledge the engineer can then decide with complete information whether or not to accommodate the legal range of digital audio on a PCM sampled system.

The goal of TL MasterMeter is to allow an engineer to use a DSP model of the reconstruction process to monitor the reconstructed waveform for potential clipping at the final mix and mastering stages. Using TL MasterMeter, engineers can compare regular and intersample peaks over time and make appropriate adjustments without sacrificing overall level or dynamic range. Utilizing an oversampled peak meter in the digital audio studio that represents the reconstruction filters in digital to analog converters is the first step toward an improvement in audio quality in music releases.

References and Further Reading

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Nyquist, Henry. "Certain Topics in Telegraph Transmission Theory." Transactions of the AIEE. Vol. 47 (April 1928): 617-644.

Shannon, Claude E. "Communication in the Presence of Noise." Proceedings of the IRE. Vol. 37 (January 1949): 10-21.

Using TL MasterMeter

TL MasterMeter uses the DSP power of Pro Tools to model the conversion process found in typical consumer devices. In technical terms, the TL MasterMeter algorithm uses a 31-tap Blackman-Harris windowed sync conversion with oversampling ratios from 2x to 8x depending on the session sample rate. The output of this DSP algorithm is then displayed visually. This assists engineers in highlighting potential distortion which may be introduced on playback of mixes, especially mixes which have been processed to be particularly loud or "hot."

TL MasterMeter can be used in two different ways during a session: Real-Time Metering or Historical Metering.

Real-Time Metering

TL MasterMeter can be used to monitor live signal levels, even if the Pro Tools transport is stopped. This can be useful in quickly determining the appropriate level for mixing and mastering.

When used in real time, the timecode information displayed in the browsers should be ignored.

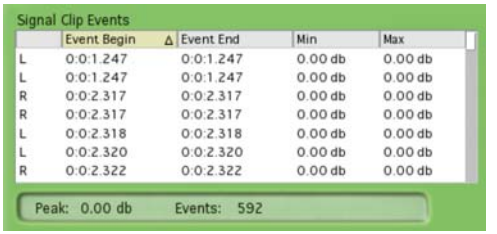
Historical Metering

To gain an overall picture of the levels in an entire session, TL MasterMeter can be inserted on a Master Fader track and the entire session played from beginning to end. This is typically done during final mix and mastering.

When session playback is complete, TL MasterMeter shows historical peak and event information for the entire session, as well as a historical list of events in the browsers for both signal clips and oversampled clips. You can then manually examine the relevant parts of the session using the timecode listed in the browsers to determine any appropriate corrective actions.

TL MasterMeter Controls and Displays

Signal Clip Events Browser



Signal Clip Events browser

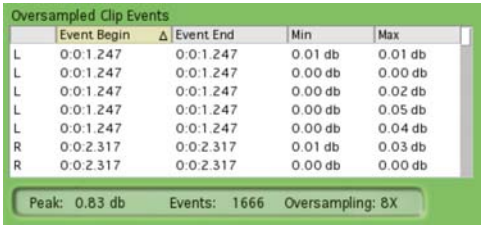
The Signal Clip Events browser displays historical clip events from the current session. The columns displayed show the relevant time code for the beginning and ending of a clip event. When used in a stereo track, the first column shows L or R to indicate if the left or right channel has clipped. The Min and Max values in this browser will always be zero, unless the Clip level is set below zero. The contents of this browser can be sorted in ascending and descending order by any column simply by clicking on the desired column one or more times.

The time information displayed in this browser is relative to where the transport started. The Offset field can be used to adjust the timecode values if TL MasterMeter is being used for historical metering but the session was started from a point other than the beginning. If TL MasterMeter is being used in real time, the timecode information in this browser can be ignored.

At the bottom of the browser, the Peak field displays the highest dB value of the audio signal received so far. The Events field shows the historical total of clip events in the audio signal. Once TL MasterMeter reaches 2,000 clip events, it ceases to record additional events. Although the meters remain active and the Peak field continues to be updated, new events will not be added to the browsers. The Events field flashes “2000” to indicate this condition.

The information in this browser is cleared using the Clear button, or is cleared automatically whenever the Pro Tools transport is started.

Oversampled Clip Events Browser



Oversampled Clip Events browser

The Oversampled Clip Events browser displays historical clip events from the DSP oversampling of the session audio. The amount of potential clipping in excess of 0 dB is also displayed.

The columns displayed show the relevant timecode for the beginning and ending of a clip event, as well as the minimum and maximum clip values created after passing through the DSP processing. When used in a stereo track, the first column shows L or R to indicate if the left or right channel has clipped. The contents of this browser can be sorted in ascending and descending order by any column simply by clicking on the desired column one or more times.

The time information displayed in this browser is relative to where the transport started. The Offset field can be used to adjust the timecode values if TL MasterMeter is being used for historical metering but the session was started from a point other than the beginning. If TL MasterMeter is being used in real time, the timecode information in this column can be ignored.

At the bottom of the browser, the Peak field displays the highest dB value of the oversampled audio received so far. The Events field shows the historical total of clip events in the oversampled audio signal. Once TL MasterMeter reaches 2000 clip events, it ceases to record additional events.

Although the meters remain active and the Peak field continues to be updated, new events will not be added to the browsers. The Events field flashes '2000' to indicate this condition.

The Oversampling field displays the current oversampling factor in use by the DSP processing. This will vary between 2x, 4x and 8x oversampling depending on the session sample rate.

The information in this browser is cleared using the Clear button, or is cleared automatically whenever the Pro Tools transport is started.

Signal Level Meter

The Signal Level meter shows the instantaneous signal level of the current audio signal. The clip light at the top of the meter can be cleared by clicking on it, or by using the Clear button.

Oversampled Level Meter

The Oversampled Level meter shows the instantaneous signal level of the current audio signal after it has been oversampled. As the oversampling process can create levels above 0 dB, this meter shows an expanded scale from –6 dB to 0 dB and from 0 dB to +6 dB.

The clip light at the top of the meter can be cleared by clicking on it, or using the Clear button.

Clear Button

The Clear button clears all of the historical information displayed in Signal Clip Events browser and the Oversampled Clip Events browser. It also click the clip lights at the top of the Signal Level and Oversampled Level meters. This information is also cleared when the Pro Tools transport is activated by pressing Play or Record.

Export Button

The Export button exports all of the information displayed in the two browsers to the clipboard as tab delimited text. It can then be pasted into any text or spreadsheet application.

View Time Menu

The View Time menu lets you select the way in which timing information is displayed, in either minutes and seconds format, or in samples format. This affects the timecode display in both the data browsers and the Offset field.

Offset Field

The Offset field offsets the values displayed in both the browsers by the value entered. This is useful for historical metering but the session was started from a point other than the beginning. The Enter key must be used after a new offset is typed for it to become active. The information shown in the browsers is updated immediately when the new Offset is entered.

For example, if the session was started from the point 1:03.901 (1 minute 3.901 seconds), this value should be entered into the Offset to ensure the timecode displayed in both of the browsers matches that of the Pro Tools session.

Clip Field

The Clip field can be used to set the clip threshold at a lower point. For example, if a session must not exceed –10 dB, the Clip field can be set to –10 dB and TL MasterMeter will treat that as the clip threshold for both signal and oversampled clip events. When the Clip field is set to a non-zero value, the Min and Max values of the Signal Clip browser are used to indicate the clip range.

chapter 10

TL Metro

Introduction

TL Metro is an RTAS metronome plug-in designed to provide you with the convenience of a traditional metronome, as well as providing advanced functionality for sophisticated time-keeping requirements.

Figure 1. TL Metro plug-in

Configuring Pro Tools for Use with TL Metro

For TL Metro to work in conjunction with the Pro Tools transport in "linked" mode, it must receive MIDI from Pro Tools. This is configured in each Pro Tools session.

To configure Pro Tools for use with TL Metro:

1 Create a new Pro Tools session.

2 Create a new audio, Auxiliary Input, or Instrument track.

3 Insert TL Metro on the new track.

4 In Pro Tools 7.0 or higher, ensure that Options > Click is enabled.

– or –

In Pro Tools 6.9 or lower, do the following:

- Select MIDI > Click Options.
- In the Click Options dialog, ensure that the velocity for the accented note is higher than that of the unaccented note. By default, they should be 127 and 100 respectively.
- Click OK.
- Ensure that the MIDI > Click is enabled.

In Pro Tools 6.1 or lower, you must also do the following:

- Select MIDI > MIDI Beat Clock
- Enable MIDI Beat Clock.
- Select TL Metro as an output.
- Click OK.

Create a Pro Tools session as a template with this MIDI setup and use the template as a basis for future Pro Tools sessions with TL Metro.

Factory Presets

TL Metro provides a number of factory presets that provide a range of sounds.

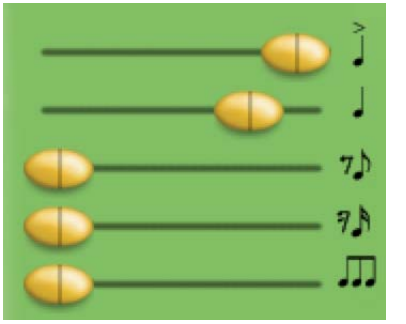
To audition a preset:

1 Select the desired preset from the Plug-in Librarian menu.

2 Click Play in TL Metro.

TL Metro Controls and Displays

Volume Sliders



Volume sliders

The volume of each individual note can be adjusted using the five Volume sliders. If the volume slider for the accented whole note is reduced to zero, the quarter note will be played instead of the whole note.

Sample Selectors

Sample selectors

Select the desired audio sample played for each of the five different notes from the corresponding Sample selector. A sample can be selected from any of up to 50 sample slots.

Master Volume

The Master Volume slider controls the overall volume of the metronome audio signal.

Tempo Controls

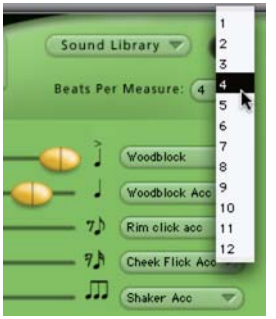
Tempo controls

Tempo can be specified by manually entering the tempo, or using the provided slider. Tempo controls are disabled when TL Metro is linked to Transport and Tempo.

Link Status

TL Metro can be linked to the Pro Tools Transport or to the Pro Tools Transport and Tempo track. For more information, see “Synchronization” on page 78.

Beats Per Measure



Selecting the number of beats per measure

Select the number of beats per measure using the Beats Per Measure selector. If Link Status is set to Transport+Tempo, TL Metro uses the Pro Tools session’s Meter track and the Beats Per Measure selector is unavailable.

Sound Library

The Sound Library menu lets you import custom samples for specific beats. For more information, see “Importing Custom Samples” on page 79.

Play Button

The Play button activates the metronome. In linked modes, the Play button is disabled and the metronome is activated when the Pro Tools transport is engaged.

Tap Button

The Tap button provides a tap tempo function. Click the tap button in time with the beat to determine the beast. The detected tempo is displayed in the Tempo field and in the LCD display.

Information Display

The LCD style information display in TL Metro displays the following:

- The current tempo in beats per minute (bpm)
- The current beat of the measure
- Link status

The MIDI name of this instantiation of the TL Metro plug-in also appears in the display beneath the tempo. This is typically shown as "TL Metro 1," "TL Metro 2," or similar. This enables multiple instantiations of TL Metro to be easily identified when routing MIDI.

If a flashing question mark appears in the information display, this indicates TL Metro has encountered an error. For example, MIDI Beat Clock may not be configured correctly. Click on the question mark for a dialog window with additional information.

Control Surfaces

TL Metro parameters can be assigned to a control surface, such as D-Command, Command|8, Control|24, or Pro Control. The abbreviated name for each of the beats when displayed on a control surface as follows.

- Accented Quarter Note = Beat 1
- Quarter Note = Beat 2
- Eighth Note = Beat 3
- Sixteenth Note = Beat 4
- Triplet = Beat 5

Synchronization

TL Metro can be synchronized to the Pro Tools Transport and Tempo using the Link Status selector.

Selecting TL Metro Link Status

Unlinked

When the Link Status is set to None, the TL Metro can be started and stopped independently of the Pro Tools Transport and Tempo. This is useful for recording when you only need the metronome for a few bars.

Linked to Transport

When the Link Status is set to Transport, the metronome will start and stop automatically when the Pro Tools Transport is engaged or disenganged.

When using TL Metro linked to Transport, three points should be kept in mind:

- Ensure that MIDI is correctly configured for TL Metro in Pro Tools (see "Configuring Pro Tools for Use with TL Metro" on page 76).
- The tempo in TL Metro must be set manually.
- TL Metro assumes you are starting from the beginning of each bar when you start the Transport.

Linked to Transport and Tempo

TL Metro can also be linked to both the Pro Tools Transport and Tempo. In this mode, TL Metro automatically follows the tempo of the Pro Tools session in addition to following the Transport.

Ensure that MIDI is correctly configured for TL Metro in Pro Tools (see "Configuring Pro Tools for Use with TL Metro" on page 76).

Customizing TL Metro

Presets

TL Metro provides a selection of factory presets, including commonly used click sounds. These presets can be selected from the Plug-in Librarian menu.

User created presets can also be stored using the Plug-in Settings menu.

To make any preset the default when TL Metro is instantiated:

1 From the Plug-in Librarian menu, select the desired preset.

2 From the Plug-in Settings menu, select Set As User Default.

3 From the Plug-in Settings menu, select Settings Preferences > Set Plug-in Default To > User Setting.

For more information on using the plug-in librarian in Pro Tools, see the DigiRack Plug-ins Guide.

Importing Custom Samples

TL Metro supports up to 50 different samples for metronome click sounds. TL Metro includes factory samples in the first 40 slots, the remaining slots are marked as "<Unassigned>."

TL Metro supports import of WAV and AIFF sound files for specific beat sounds. Sounds can be loaded into any one of the 50 available slots. Typically, user samples are loaded into the unassigned slots in order to avoid overwriting the factory samples. However, any of the 50 slots can be replaced by user imported samples if desired.

For best results, imported sounds should have the following characteristics.

- The sound should start in the very first sample of the file, and have a sharp attack to ensure proper timing.
- The sample should be normalized before importing.
- Sound length should be limited to approximately one second to avoid playback problems.

To import a sound:

1 Click the Sound Library button to display the sample menu.

2 Select an unassigned slot.

3 In the resulting File dialog, select the WAV or AIFF file you want to import.

4 Click OK.

The name of the selected file is displayed in each sample menu. To use the imported sample, select it from the sample menu for the appropriate beat.

Factory and imported samples are stored in a preferences file named “TL Metro Plug-in” located in your system preferences folder. On Windows, it’s located in <system drive letter>:\Documents and Settings\<user name>\Application Data\Trillium Lane\TL Metro PlugIn.rsr. On Macintosh, it’s located in Users\<user name>\Library\Preferences\TL Metro Plug-in.

If you want to use the particular samples you imported into TL Metro on a different Pro Tools system, copy this preferences file between systems. If the TL Metro preferences file is deleted, all factory and user samples will be deleted. To restore TL Metro to the factory samples only, quit Pro Tools and delete this preferences file. The next time you use TL Metro, it will recreate the preferences file with only the factory samples.

chapter 11

TL Space TDM and TL Space Native

Introduction

TL Space is a convolution reverb TDM, RTAS, and AudioSuite plug-in. There are two versions of TL Space: TL Space TDM and TL Space Native. TL Space TDM includes all plug-in formats. TL Space Native includes RTAS and AudioSuite plug-in formats only.

TL Space was designed to be the ultimate reverb for music and post-production applications. By combining the sampled acoustics of real reverb spaces with advanced DSP algorithms, TL Space offers stunning realism with full control of reverb parameters in mono, stereo, and surround formats.

Figure 1. TL Space plug-in

Feature Highlights

TL Space has an extensive feature set designed to assist users in creating the best reverb effect in the shortest possible time.

Listed below are some of the key innovations that TL Space offers over traditional software reverbs.

Reverb Features

- Mono, Stereo, and Quad and 5.0–channel output support
- Multiband EQ
- Independent wet/dry and decay levels
- Separate reverb early and late levels and length
- Control of early size, low-cut, and balance
- Pre delay and late delay controls
- Precise control of low, mid, and high decay crossover
- Adjustable waveform reverse, displayed in beats per minute
- Waveform processing bypass

Interface Features

- Full waveform view, zoom, and channel highlight functions
- Onscreen input and output metering with clip indicators
- Impulse response information display

Impulse Response (IR) Loading and Organization Features

- Scrollable IR browser makes finding impulse responses easy
- Browser supports user defined IR groups on any local drives
- Browser keyboard shortcuts
- IR favorites function
- Automatically recognizes common IR formats for one click loading
- IR browser hides to save screen real estate
- Quick browser buttons allow rapid IR loading and preview

Automation and Ease of Use Features

- Snapshot mode supports rapid changes between ten predefined reverb scenes
- Picture preview mode allows user to view image files stored with impulse responses
- Impulse responses stored directly in Pro Tools presets and sessions for easy session sharing
- New impulse responses can be copied to system and loaded without closing TL Space
- iLok support for quick and easy relocation to other Pro Tools systems

Surround and Post-Production Features

- Full input and output surround metering on screen at all times
- Separate front, center, and rear levels
- Independent front and rear decay
- Snapshot mode ideal for post automation requirements
- Seamless snapshot switching (RTAS)
- Automatic phantom channel creation

IR Library

- A wide variety of both real and synthetic reverb spaces and effects
- Mono, stereo, and surround formats
- All reverb impulse responses stored in WAV file format

Reverb and Convolution

Reverb Concepts

Reverberation is an essential aspect of the sound character of any space in the real world. Every room has a unique reverb sound, and the qualities of a reverb can make the difference between an ordinary and an outstanding recording. The same reverb principles responsible for the sound of a majestic, soaring symphony in a concert hall also produce the booming, unintelligible PA system at a train station. Recordings of audio in the studio context have traditionally been captured with a minimum of real reverb, and engineers have sought to create artificial reverbs to give dry recorded material additional dimension and realism.

The first analog reverbs were created using the 'echo chamber' method, which is comprised of a speaker and microphone pair in a quiet, closed space with hard surfaces, often a tiled or concrete room built in the basement of a recording studio. Chamber reverbs offered a realistic, complex reverb sound but provided very little control over the reverb, as well as requiring a large dedicated room.

Plate reverbs were introduced by EMT in the 1950s. Plate reverbs provide a dense reverb sound with more control over the reverb characteristics. Although bulky by modern standards, plate reverb units did not require the space needed by a chamber reverb. Plate reverbs function by attaching an electrical transducer to the center of a thin plate of sheet metal suspended by springs inside a soundproof enclosure. An adjustable damping plate allows control of the reverb decay time and piezoelectric pickups attached to the plate provide the return reverb signal to the console. An alternative and less expensive analog reverb system is the spring reverb, most commonly seen in guitar amplifiers beginning in the 1960s. Similar to the plate reverb in operation, the spring reverb uses a transducer to feed the signal into a coiled steel spring and create vibrations. These are then captured via a pickup and fed back into an amplifier.

Since the advent of digital audio technology in the 1980s, artificial reverberation has been created primarily by digital algorithms that crudely mimic the physics of natural reverb spaces by using multiple delay lines with feedBack. Digital "synthetic" reverb units offer a new level of realism and control unavailable with older analog reverb systems, but still fall short of the actual reverb created by a real space.

Components of Reverb

Reverberation sound in a normal space usually has several components. For example, the sound of a single hand clap in a large cathedral will have the following distinct parts.Initially, the direct sound of the hand clap is heard first, as it travels from the hand directly to the ear which is the shortest path. After the direct sound, the first component of reverb heard by a listener is reflected sound from the walls, floor and ceiling of the cathedral. The timing of each reflection will vary on the size of the room, but they will always arrive after the direct sound. For example, the reflection from the floor will typically occur first, followed typically by the ceiling and the walls. The initial reflections are known as early reflections, and are a function of the reflective surfaces, the position of the audio source and the relative location of the listener.

A small room may have only a fraction of a second before the first reflections, whereas large spaces may take much longer. The elapsed time of the early reflections defines the perceived size of the room from the point of view of a listener. TL Space offers various controls over early reflection parameters.

The time delay between the direct sound and the first reflection is usually known as Pre Delay. TL Space lets you adjust Pre Delay. Increasing the Pre Delay will often change the perceived clarity of audio such as vocals.

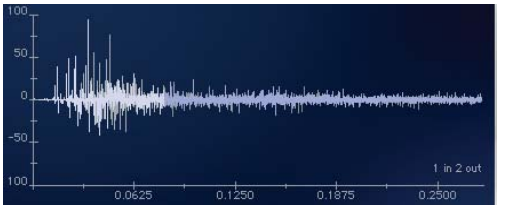
Reflections continue as the audio reaches other surfaces in a space, and they create more reflections as the sound waves intermingle with one another, becoming denser and changing in character depending on the properties of the room. As the room absorbs the energy of the sound waves, the reverb gradually dies away. This is known as the reverb tail and may last anywhere up to a minute in the very largest of spaces.

The reverb tail will often vary at different frequencies depending on the space. Cavernous spaces often produce a booming, bassy reverb whereas other spaces may have reverb tails which taper off to primarily high frequencies. TL Space allows for equalization of the frequencies of the reverb tail in order to adjust the tonal characteristics of the reverb sound.

A reverb tail is often described by the time it takes for the sound pressure level of the reverb to decay 60 decibels below the direct sound and is known as RT60. Overall, TL Space allows decay to be adjusted as required. For surround processing, decay can be adjusted for individual channel groups.

Convolution Reverb

Convolution reverb goes beyond traditional analog and synthetic digital reverb techniques to directly model the reverb response of an actual reverb space. First, an impulse response (IR) is taken of an actual physical space or a traditional reverb unit. An IR can be captured in mono, stereo, surround, or any combination. The IR, as displayed by TL Space, clearly shows the early reflections and the long decay of the reverb tail.



Impulse Response sample

TL Space uses a set of mathematical functions to convolve an audio signal with the IR, creating a reverb effect directly modeled on the sampled reverb space. By using non-reverb impulse responses, TL Space expands from reverb applications to a general sound design tool useful for many types of audio processing.

The downside of traditional software based convolution reverbs is the heavy CPU processing requirement. This has often resulted in earlier convolution reverbs with unacceptable latency. Many early software convolution reverbs did not offer adequate control over traditional reverb parameters such as Pre Delay, EQ, or decay time.

TL Space redefines reverb processing in Pro Tools by offering zero and low latency convolution with the full set of controls provided by traditional synthetic reverbs.

TL Space System Design

TL Space uses advanced DSP algorithms to deliver convolution processing on both TDM and native host processing. Figure 2 on page 85 shows the internal system design of TL Space and demonstrates how TL Space processes the audio signal.

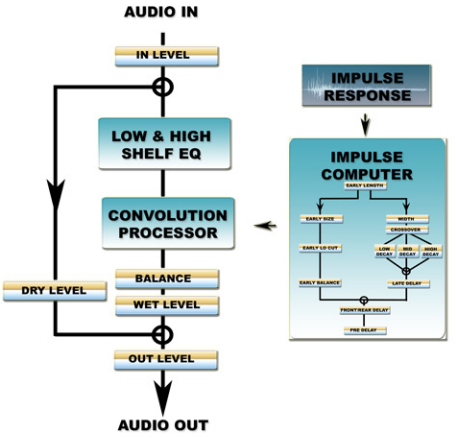


Figure 2. TL Space internal system design

The impulse computer is an internal module of TL Space that provides extensive user control over the currently loaded impulse response waveform. When the user adjusts the parameters shown below, the IR is automatically recalculated by the impulse computer and reloaded into the convolution processor. Figure 3 on page 85 shows the internal functions of the impulse computer as it processes the waveform and loads it into the convolution processor.

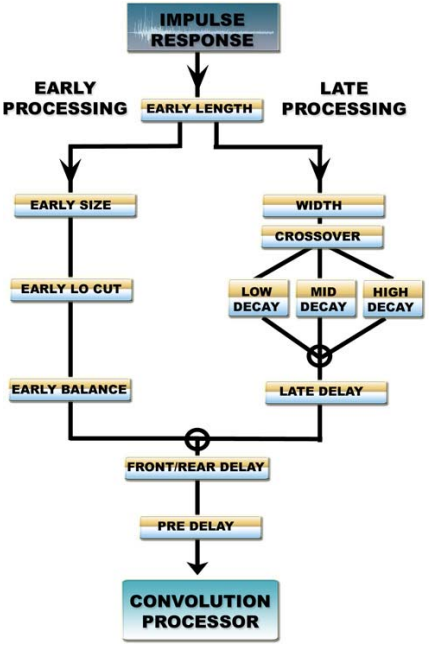


Figure 3. TL Space internal functions of the impulse computer

System Performance

Supported Plug-in Formats

TL Space is available as TDM, RTAS, and AudioSuite plug-in formats depending on your Pro Tools system and version of TL Space.

⚠ *HTDM plug-ins are not supported in Pro Tools 7.0 or higher. Use the corresponding TDM or RTAS plug-in instead.*

TL Space TDM Edition includes all plug-in formats. TL Space Native Edition includes RTAS and AudioSuite plug-in formats only. The characteristics of each plug-in format, including maximum reverb time, sample rate support, and latency are shown in Table 12 on page 86.

Latency

Latency is a function of how Pro Tools processes audio and is typically measured in samples. The latency of each different mode of TL Space is shown in Table 12. Latency is displayed in the Mix window for each track in Pro Tools TDM using Delay Compensation view.

Near zero latency on HD Accel is ideal for recording live, as TL Space latency is kept to five samples or less. RTAS plug-ins have more inherent latency. However, for some users latency is not critical and RTAS plug-ins may lend themselves to post production environments with a requirement to switch seamlessly in real time between reverb snapshots.

Regardless of the plug-in format, Pro Tools TDM 6.4 or higher can compensate for any latency automatically on playback using Pro Tools Delay Compensation.

Table 12. TL Space Plug-in Format Characteristics

Plug-in	Format	DSP	Maximum reverb time (sec)	Maximum sample rate (khz)	Dry latency (samples)	Wet latency (samples)
TL Space Short	TDM	HD	1.1	48 kHz	3	1029
TL Space Medium	TDM	HD Accel	2.3	96 kHz	3	5
TL Space Long	TDM	HD Accel	3.4	96 kHz	3	5
TL Space	RTAS	—	10.0	96 kHz	0	480
TL Space	AudioSuite	—	10.0	96 kHz	—	—

Channel Support

TL Space supports a variety of channel formats depending on your Pro Tools system, including mono, stereo, quad, and 5.0 channels. The following table outlines channel support in specific modes.

⚠ *True Stereo at 96 kHz is only available in TL Space Long.*

Stereo processing is available in both *summed stereo* and *true stereo*. Summed stereo processing uses the traditional reverb technique of summing the two input channels into a single channel that is processed by the reverb. The stereo image of the input is not reproduced in the reverb. Instead, the reverb processes the input as if it is from a single audio source positioned in the center. An IR used for summed stereo processing would have a single sound input source and multiple sound outputs.

True stereo processing processes two separate input signals. This stereo image of the two inputs is reproduced in the reverb. An IR used for true stereo requires two sound sources, and hence the total number of channels in the IR will be equal to double the number of outputs. True stereo is more CPU and DSP intensive than summed stereo, consuming twice the resources.

To use true stereo with TL Space on TDM, insert TL Space in true stereo. Stereo RTAS TL Space automatically switches between summed and true stereo modes depending on the IR loaded.

Table 13. TL Space Channel Formats

Plug-in	Format	Mono Input				Stereo Input			True Stereo Input	
		Mono	Mono to Stereo	Mono to Quad	Mono to 5.0	Stereo to Stereo	Stereo to Quad	Stereo to 5.0	True Stereo to Stereo	True Stereo to Quad
TL Space Short	TDM	Y	Y	Y	Y	Y	Y	Y	Y	Y
TL Space Medium	TDM	Y	Y	Y	—	Y	Y	—	Y	Y
TL Space Long	TDM	Y	Y	Y	Y	Y	Y	Y	Y	Y
TL Space	RTAS	Y	Y (LE only)	—	—	Y	—	—	Y	—
TL Space	AS	Y	—	—	—	Y	—	—	Y	—

DSP Usage on TDM systems

On Pro Tools HD and HD Accel systems, TL Space can be instantiated as TL Space Short, Medium and Long. The plug-in name displayed in the menu refers to the maximum reverb time as shown in Table 12 on page 86.

The different versions of TL Space have different DSP usage requirements. A Pro Tools HD card contains nine identical DSP chips. A Pro Tools HD Accel card contains nine DSP chips, four of which offer external SRAM. In some modes, TL Space requires Accel chips with external SRAM. Table 14 shows the TL Space DSP requirements by reverb time.

Table 14. TL Space HD DSP requirements

Plug-in	Format	DSP
TL Space Short	TDM	Any HD DSP chip
TL Space Medium	TDM	Any HD Accel chip with external SRAM
TL Space Long	TDM	Any HD Accel chip with external SRAM

The number of DSP chips required is a function of the number of inputs and outputs, and the type of processing in use. The maximum chip usage is 8 DSP chips across two HD Accel cards. Table 15 shows the TL Space DSP requirements by channel.

Table 15. TL Space DSP requirements by channel

Input	Output	Maximum number of DSP chips
Mono	Mono	1
	Stereo	2
	Quad	4
	5.0	5
Stereo	Stereo	2
	Quad	4
	5.0	5
True Stereo	Stereo	4
	Quad	8

These numbers represent the maximum possible DSP usage of TL Space Long. For example, TL Space Medium has only 50% of the DSP requirement in supported stereo and quad channel formats.

CPU Usage

On all Pro Tools systems, TL Space can be instantiated as an RTAS plug-in. This impacts the performance of the CPU. CPU usage can be monitored in the System Usage window.

To optimize performance of TL Space for RTAS processing, set the Hardware Buffer Size in the Playback Engine to 512 samples.

Impulse Responses

IR Processing Overheads

Adjusting some controls in TL Space requires the impulse computer to recalculate the waveform and reload it into the convolution processor. This operation uses DSP and host processing capacity. When this occurs, some control lag may be experienced. This should be kept in mind if controls are being automated in real time during a session.

How Impulse Responses Are Captured

An IR of an actual physical space is captured using a combination of an impulse sound source and capture microphones. The sound source is used to excite the physical space to create a reverb, and can be a starter pistol or a frequency tone played through a speaker. The microphones can be placed in various configurations. The resulting IR is then processed to create a digital representation of both the physical space, potentially colored by the sound source and the type of microphone used. Likewise, an IR can be captured of effects hardware, such as analog reverbs, by sending a test pulse through the unit and capturing the result digitally. In addition to reflecting reverb or delay characteristics, an IR also reflects tonal character and can be used for a variety of effects beyond pure reverb applications.

Depending on the capture technique used, the IR may be suitable for use with mono, stereo, surround or a combination of those formats. For example, a capture setup with a single sound source and two microphones is ideal for a mono to stereo IR.

Multiple IRs may be taken of a physical space where the sound source has been moved to physical locations. Each resulting IR may be used to create individual reverbs for separate instruments. This effectively allows an engineer to place each instrument in the reverb sound field as if the instruments were physically arranged in the space.

Impulse Response Formats

TL Space reads a wide range of IR formats automatically, including WAV, SDII, and AIFF file formats, allowing you to import a variety of IRs. TL Space supports IR sample rates from 22 kHz up to 96 kHz in bit depths from 16 to 32 bits. In addition, TL Space supports the display of JPEG format picture files stored with IRs.

To use third party IR libraries with TL Space:

1 In the IR Browser, select Edit > Import Other IR Folder.

2 Locate and select the library on your hard drive.

3 Click Choose.

TL Space will add the new library to the IR browser.

IR Library Installation

If you purchased the boxed version of TL Space, it includes an installer disc of the standard TL Space IR Library. If you purchased TL Space online, you will need to download IR Libraries from Digidesign's TL Space Online IR Library. For more information on downloading and installing IR Libraries from the TL Space Online IR Library, see "Installing TL Space IR Packages" on page 99.

To install the TL Space IR Library from disc:

1 Insert the correct TL Space IR library installer disc for your operating system (Windows or Macintosh) in your computer's CD/DVD drive.

2 Double-click the TL Space IR library installer application to launch it. Read the license agreement. If you agree to the terms, click Accept.

3 Click Install to perform an easy install of the entire IR library on the system drive.

4 If you want to install only part of the library, select Custom Install and select the parts of the library you want to install.

5 When the installation is completed, click Quit to finish the installation.

Multichannel Impulse Response Formats

TL Space supports IRs in multichannel or multiple mono audio files. IRs with a single input are used for mono or summed stereo processing and can be stored as a single interleaved multichannel file, or as multi-mono files. IRs with stereo inputs used for true stereo processing must be stored as multi-mono files.

IR channel formats

Input	Output	Channel Order	File format
Mono	Mono	—	Mono file
Mono	Stereo	L R	One 2-channel file or two mono files
Mono	Quad	L R Ls Rs	One 4-channel file or four mono files
Mono	5.0	L C R Ls Rs	One 5-channel file or five mono files
Stereo	Stereo	L R	Four mono files
Stereo	Quad	L R Ls Rs	Eight mono files
Stereo	5.0	L C R Ls Rs	Ten mono files

For multi-mono files, TL Space understands the following filename conventions, based on those used by Pro Tools. The filename format is based on the impulse name plus two suffixes which indicate input and output channels as follows:

```
Impulsename.inputchannel.outputchannel.type
```

- Impulsename is the name of the impulse. Mixing multiple IR files with the same Impulsename in the same folder is not supported.
- Inputchannel refers to the number of sources used for the impulse, starting at the number 1. An IR captured in true stereo will usually have two input channels numbered 1 and 2. If there is only one input channel, then inputchannel is optional and can be omitted. Also, instead of using numbers 1 and 2, the inputchannel can be designated as L and R.
- Outputchannel refers to the microphones used to capture the impulse, and corresponds to your studio monitors. outputchannel is designated using the standard L, C, R, Ls and Rs extensions.
- Type is optionally .WAV, .AIFF or .SD2. For best performance, filenames should always be suffixed with type to avoid TL Space having to open the file to determine audio format.

The following examples show how various multi-mono IR files could be named.

Stereo to Stereo IR

Cathedral.1.L.wav
Cathedral.1.R.wav
Cathedral.2.L.wav
Cathedral.2.R.wav

Stereo to 5.0 IR

Cathedral.1.L.wav
Cathedral.1.C.wav
Cathedral.1.R.wav
Cathedral.1.Ls.wav
Cathedral.1.Rs.wav
Cathedral.2.L.wav
Cathedral.2.C.wav
Cathedral.2.R.wav
Cathedral.2.Ls.wav
Cathedral.2.Rs.wav

Mono to Quad IR.

Cathedral.L.wav
Cathedral.R.wav
Cathedral.Ls.wav
Cathedral.Rs.wav

Stereo to quad IR

Cathedral.1.L.wav
Cathedral.1.R.wav
Cathedral.1.Ls.wav
Cathedral.1.Rs.wav
Cathedral.2.L.wav
Cathedral.2.R.wav
Cathedral.2.Ls.wav
Cathedral.2.Rs.wav

Channel Compatibility

TL Space works best with IRs that match your current channel configuration. For example, if TL Space is instantiated in a mono to stereo configuration, stereo IRs will be highlighted in the IR browser. The IR information displayed in the display area shows how many inputs and outputs an IR has. For example, an IR listed as 2 input 4 output is a stereo to quad IR.

If an IR is loaded that doesn't match the current configuration, TL Space will try to create the best possible match with the IR provided. For example, if a stereo IR is loaded into a mono instantiation of TL Space, TL Space will sum the left and right channels in order to mimic a stereo reverb with both channels panned to mono.

If an IR is loaded that is missing a required channel, TL Space will automatically create a phantom channel for the IR if needed. For example, if a stereo IR is loaded into a quad instantiation, TL Space will compute left and right surround channels automatically based on the existing channels. If a quad IR is loaded into a 5.0 channel instantiation, TL Space will compute a phantom center from the front left and right channels. Phantom channels are indicated by comparing the IR information displayed in the display area to the number of channels in use. For example, a 2 input 4 output IR used with a 5.0 output instantiation of TL Space will automatically have a phantom center channel created.

Presets

TL Space supports the Pro Tools Plug-in Librarian. When an IR file is loaded, all controls remain at their current positions as the IR file only contains the audio waveform. By default, presets contain both the IR waveform and control settings and can be saved as required so that specific control settings can be retained for future sessions. If you save presets without embedding the IR waveform, be sure that you include the IR waveform with the session when transferring the session between different Pro Tools systems.

There are two important items to note about using presets in TL Space:

- TL Space presets do not store information for the Wet and Dry level controls. This is to enable you to change presets without losing level information. Likewise, the Pro Tools Compare function is not enabled for these controls.
- A TL Space preset only includes the currently selected snapshot.

⚠ *IR files are audio files only and do not contain information about TL Space control settings. If you wish to save specific control settings for an IR, you should save them using the Pro Tools Plug-in Librarian or using the snapshot facility of TL Space.*

Snapshots

In addition to presets, TL Space lets you manage a group of settings, called snapshots, that can be switched quickly using a single, automatable control. Each snapshot contains a separate IR and settings for all TL Space controls.

IRs in a snapshot have been pre-processed by the impulse computer and can be loaded instantly into the convolution processor. With RTAS, switching between snapshots does not cause audio to drop out. Snapshots are useful, for example, in post production mixes when the reverb is changed for different scenes via automation as the picture moves from one scene to another.

Embedding IRs in Sessions, Presets, and Snapshots

By default, all IR and snapshot info used by TL Space (including up to ten IRs) is saved in the Pro Tools session file. Likewise, plug-in presets contain a saved copy of the IR and settings in the currently selected snapshot. Session and preset file sizes will increase as TL Space stores each IR waveform inside the file. This provides maximum compatibility between different Pro Tools systems without the need for them to have identical IR libraries.

IR embedding can be disabled in TL Space's Preferences. If IR embedding is disabled, TL Space stores only a reference to the name of the IR file. When the session is transferred to a different system, TL Space attempts to load the matching IR file from the TL Space IR library. For maximum compatibility, ensure that all of the appropriate IR files are available on the new system.

When working with an IR that only exists in a session file, ensure it is saved to a separate snapshot or preset. If the IR is overwritten by loading a new IR and the session is saved, the original IR cannot be recovered without access to the original IR file.

By default, Pro Tools presets or session files created using TL Space automatically include copies of all relevant IR waveforms. This provides maximum compatibility of session files between different Pro Tools systems.

It is your responsibility to ensure that you observe the copyright on any IR transferred to a third party in this fashion.

TL Space Controls and Displays

The TL Space interface is divided into several sections, each of which is described in the following section.

Figure 4.

Display Area

The display area of TL Space operates in four modes, indicated by the Display Mode selectors at the top right hand corner of the TL Space window. The modes from left to right are Waveform, Picture Preview, Snapshot, and Preferences.

Display Mode selectors

The Display area changes based on the selected mode. At all times, the Info bar at the bottom of the display area window shows the following controls and information.

Info bar

Snapshot Menu A pop-up menu allowing quick selection or automation of a snapshot.

IR Name Displays the folder and file name of the currently loaded IR.

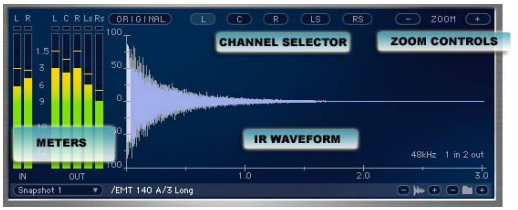
Quick Browser Controls The Quick browser controls allow the IR to be quickly changed even when the IR browser is closed, automatically loading each IR sequentially. The Waveform icons step backwards and forwards through IRs and automatically load the IR file. The Folder icons step backwards and forwards through folders. The Quick browser requires an IR to be currently loaded from the IR browser. If no such IR is loaded (for example, the IR in use has been loaded from a preset or session but does not exist in the IR browser), the Quick browser controls are inoperative.

Waveform Mode

Waveform mode is selected using the Waveform icon at the top of the TL Space window. In Waveform mode, the display area shows the IR waveform with the following controls.

Waveform mode displays the IR waveform along a horizontal axis marked in seconds and the vertical axis marked in amplitude. The early section of the waveform is highlighted in a lighter color. In addition, the channel selector highlights the current channel in the waveform.

IR information such as sample rate and number of input and output channels is displayed at the bottom right of the waveform.



Display area, Waveform mode

The controls in Waveform mode function as follows:

Original Bypasses all waveform processing, allowing the original IR to be auditioned. This control effectively bypasses the processing in the IR computer as shown in the system diagram.

Channel Selectors Displays from one to five channels (in the order Left, Center, Right, Left Surround, Right Surround). Click the desired channel to display the IR waveform for that channel. In Mono mode, no channel selector is displayed.

Zoom Zooms in and out on the time axis for the waveform display.

Picture Preview Mode

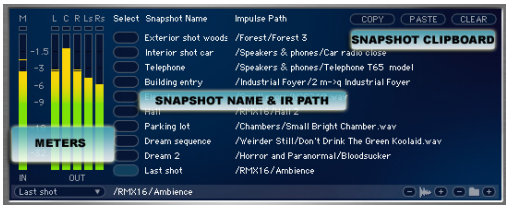
Picture Preview mode is selected using the Picture Preview icon at the top of the TL Space window. When selected, Picture Preview mode shows pictures associated with the IR. For an IR provided with TL Space, this will usually include a photograph of the location, and an image with technical details such as microphones used or an overview of the microphone setup. Thumbnails of images are displayed in the right hand column. In this mode, the IR browser can be used to view the associated pictures without loading the IR itself.

Display area, Picture Preview mode

Snapshot Mode

Snapshot mode is selected using the Snapshot icon at the top of the TL Space window. TL Space provides ten snapshots available at all times. Each snapshot stores a separate IR waveform and all control settings. Snapshots are optimized for quick loading into the convolution processor, and switching between snapshots is considerably faster than loading a new IR. Snapshot mode allows all ten snapshots to be viewed as well as the option to select, rename, copy, paste, and clear snapshots.

The name of the currently selected snapshot is always displayed in the Info bar at the bottom of the display area, and can be automated. This lets you switch reverb settings during playback and is useful for post production sessions where the reverb setting may change as the scene changes.



Display area, Snapshot mode

The active snapshot can be selected in one of two ways. At any time, a snapshot can be selected by using the snapshot menu in the Info bar. Alternatively, when the display area is in Snapshot mode, a snapshot can be selected by clicking the selection area next to the snapshot name.

Select Lets you select which snapshot is currently loaded.

Name Displays the name of each snapshot. By default, snapshots are named “Snapshot 1” through “Snapshot 10.” Snapshots can be renamed by clicking on the snapshot name and entering a new name followed by the Enter key (Windows) or the Return key (Macintosh).

Sample Path Displays the name of the IR selected for each snapshot.

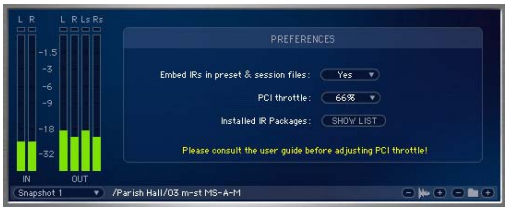
Copy Copies the currently selected snapshot settings into a clipboard.

Paste Pastes the clipboard into the currently selected snapshot. Note that the name of the existing snapshot is not changed by pasting a new snapshot, in order to avoid duplicate snapshot names.

Clear Clears the IR from the currently selected snapshot.

Preferences Mode

Preferences mode is selected using the Preferences icon at the top of the TL Space window. This displays a number of preferences settings for TL Space.



Display area, Preferences mode

Embed IRs in Preset & Session Files Enables or disables the embedding of IR waveforms in presets and session file. By default, this is enabled.

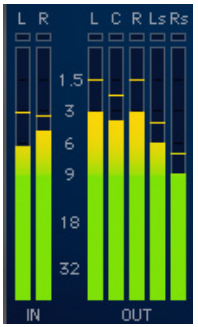
PCI Throttle Increasing the PCI throttle control reduces PCI contention for Pro Tools systems when using PCI video capture hardware. For more information, see "PCI Bus Contention" on page 105.

For most users, this control should not be adjusted. This control is only displayed for TDM instantiations of TL Space on Pro Tools|24 Mix and Pro Tools|HD systems.

Installed IR Packages Displays a list of installed TL Space IR packages and their versions.

Meters

The Meters display the amplitude of the incoming and outgoing audio signals by channel. The number of meters shown will depend on the number of input and output channels. Input meters may be mono or stereo, and output meters may be mono, stereo, quad, or 5.0 channels. Each meter is marked as either mono, left, right, center, left surround, or right surround. A logarithmic scale marked in decibels and momentary peaks are also displayed on the meter.



Meters, stereo input to 5.0 output shown

The red Clip indicator indicates that audio for that channel has exceeded 0 dB in amplitude. When a channel has clipped once, the clip indicator remains lit and additional clips will be shown by a variation in the color of the indicator. The clip indicator for all channels can be cleared by clicking on any clip indicator, or selecting the Pro Tools Clear All Clip Indicators command.

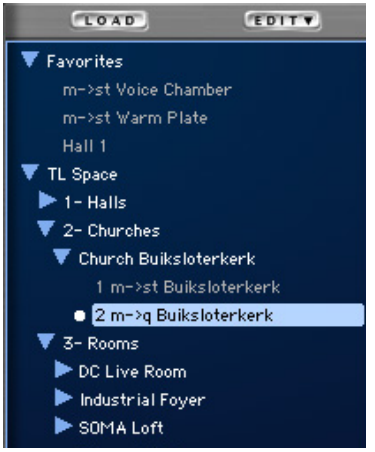
The meters do not function when TL Space is used as an AudioSuite plug-in.

IR Browser

The IR Browser icon at the top right hand corner of the TL Space window opens the IR browser. By default, TL Space will display a single IR group for the TL Space library.

The IR browser lets you quickly and easily install, locate, and organize IRs on local hard drives. The Load and Edit buttons in the IR browser let you install and import IRs, create Favorites, and change the IR groups displayed.

TL Space automatically highlights each IR that matches the current channel configuration. For example, when using a TL Space Stereo to Quad inset, each IR with that configuration is highlighted. Impulses that are not highlighted can still be loaded, and TL Space tries to adapt the IR to the current channel format (see "Channel Compatibility" on page 92).



IR Browser

An IR can be loaded by double clicking with the mouse, or using the Load button displayed at the top of the IR browser drawer. The currently loaded IR is highlighted with a small dot next to the file name in the browser.

The IR browser can be operated using the following shortcuts. When the IR browser has keyboard focus, a blue highlight is displayed around the edge of the browser window.

IR browser keyboard shortcuts

Browser Navigation	Arrow keys
Load IR	Enter (Windows) Return (Macintosh)
Open/close all folders	Alt click (Windows) Option click (Macintosh)
Edit menu	Right click (Windows or Macintosh) Control click (Macintosh)
Return keyboard focus to Pro Tools	Escape key

The IR browser lets you install and import new IRs. Each IR folder reflects a folder on the hard drive. When importing a new IR folder, a standard file dialog will be displayed to enable the user to choose the folder that contains the desired IR.

The IR browser also provides a Favorites folder, which is a user defined group of links to IRs in the IR browser. Favorites can be sorted in any desired order by dragging and dropping them as required. In addition, folders can be created in Favorites using the 'New Folder in Favorites' function in the Edit menu.

To add an IR file or folder to the Favorites folder:

1 In the IR browser, select the desired IR file or folder.

2 From the IR browser's Edit menu, select Add to Favorites.

IR Browser Edit Menu

The IR browser's Edit menu contains the following commands:

Download TL Space IR Package Opens a Web browser to the TL Space online IR library.

Install TL Space IR Package Installs a new IR package downloaded from the TL Space online library (see "Installing TL Space IR Packages" on page 99).

Import Other IR Folder Lets you import a new IR folder in common file formats. By default, the new IR is given the same name as the selected folder.

Remove Imported IR Folder Lets you remove the currently selected IR folder.

Rename Imported IR Folder Lets you rename the currently selected IR folder.

Add to Favorites Adds the currently selected IR to the Favorites group at the top of the browser window.

New Folder in Favorites Creates a folder in the Favorites group. Favorite IRs can be dragged and dropped into the folder.

Rename Favorites Folder Lets you rename the currently selected Favorites folder.

Remove from Favorites Removes the currently selected IR from the Favorites group. This function only removes the link in the Favorites group and does not remove the original IR file from the system.

Reset to Default IR Library Resets TL Space to the default library. This also removes any user imported IR folder, but does not affect the Favorites folder, or IR packages installed from the TL Space online IR library.

Rescan for Files Forces TL Space to check the hard drive for new IRs. This is typically required if new IR files have been copied to the hard drive. Using the Rescan for Files command loads new IRs into TL Space without needing to close TL Space or the Pro Tools session.

⚠ *TL Space may pause briefly while it scans the hard drives to locate IRs or if all folders are opened at once. The amount of time taken is proportional to the number of folders and IRs scanned.*

Installing TL Space IR Packages

Additional IR packages for TL Space are available for registered users to download from the TL Space Online IR Library at:

www.digidesign.com/tlspace/impulselibrary/

These package files are supplied in a lossless compressed format.

To install a TL Space IR package:

1 In the TL Space IR browser, select Download IR Package from the Edit menu. Your default Web browser launches and loads the Digidesign TL Space Online IR Library website (www.digidesign.com/tlspace/impulselibrary/).

2 Click Download

3 Login using your email address and password. You may need to create a new account if you have not yet registered TL Space.

⚠ *To download IR packages from the TL Space Online IR Library, you must first register with Digidesign and create an online profile.*

4 Click Continue.

5 Click Download for the IR package you want.

6 In TL Space, select Install TL Space IR Package from the Edit menu.

7 In the resulting dialog, locate and select the file you downloaded.

8 Click Choose.

TL Space will display a summary of the IR package with a short description, copyright statement, and a list of the contents.

9 Click Install to install the IR package. A window is displayed with the results of the installation.

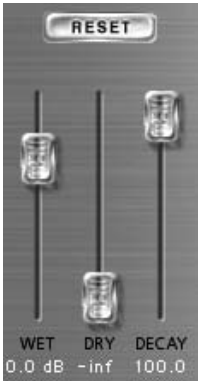
The IR browser in TL Space updates to include the new IR.

If a problem occurs with the IR installation, TL Space displays an error message. Review the log file stored in the TL Space IR library for further details. Each IR package has a version number, and TL Space warns you if an IR package has already been installed.

The details of all installed IR packages can be reviewed using the Show Packages option in Preferences mode.

Primary Controls

The primary control group is visible at all times and allows control of key reverb parameters. This includes the wet and dry levels of the audio passing through TL Space.



TL Space primary controls

Reset Resets all TL Space parameters except Wet, Dry, and Input and Output Level.

Wet Controls the level of wet or effected reverb signal, from –inf dB to +12 dB.

Dry Controls the level of dry or unaffected reverb signal, from –inf dB to +12 dB.

Decay Controls the overall decay of the IR waveform and is displayed as a percentage of the original. When Decay is adjusted, the waveform is recalculated in real time.

Group Selectors

TL Space presents reverb controls in five different groups. Each group is activated by selecting the corresponding selector.

Group Selectors

Levels

The Levels group provides control of the overall input and output of the reverb, including individual controls for early and late reflections, and independent front, rear, and center levels for surround outputs.

Input Cuts or boosts the input signal level from –inf dB to +12 dB.

Output Cuts or boosts the output signal level from –inf dB to +12 dB.

Early Cuts or boosts the levels of the early reflections from –inf dB to +12 dB.

Late Cuts or boosts the levels of the late reflections from –inf dB to +12 dB.

Front/Rear/Center In quad and 5.0 channel output modes, Cuts or boosts the front, rear, and center signal levels from –inf dB to +12 dB. In 5.0 output mode, the level of the Center channel is affected by both the Front and Center controls.

Delays

The Delays group allows control of delay timings for the reverb. When changes are made to any control in the Delays group, the IR waveform is recalculated and displayed in the Waveform display.

Pre Delay Adjusts length of the Pre Delay from –200 to +200 ms. The Pre Delay is the time between the direct sound and the first reflection. Increasing the Pre Delay often changes the perceived clarity of audio such as vocals. Pre Delay adjusts the delay of the overall impulse and affects both the Early and Late portions of the IR equally.

Pre Delay can be set to negative values to allow for subtle or radical changes to the reverb. For example, a small negative Pre Delay setting can be used to eliminate the early portion of an IR. A large negative Pre Delay setting lets you use the very end of a reverb tail for creative sounds not possible with standard reverbs.

Late Delay Adjusts length of the Late Delay from zero to +200 ms. The Late Delay is the time between the Early Reflections and the Late Reflections or tail of the reverb.

Increasing the Late Delay control from zero allows the reverb tail to be delayed so that it does not start immediately after the early portion of the IR. As Late Delay is increased, the reverb tail starts later in time and makes the reverb space sound larger. Large amounts of late delay can be used to achieve creative effects not possible with standard reverbs.

Front/Rear/Center Delay In quad and 5.0 channel output modes, adjusts length of the Front, Rear, and Center Delays independently from zero to +200 ms.

Early

The Early group controls the character of the early portion of the IR and the early reflections. The primary control is Early Length which defines the size of the early portion of the IR waveform. When loading an IR from an audio file, TL Space relies on the user to define which part of the IR is the early portion of the waveform. By default, the Early length is set to 20 ms.

The early portion of the IR waveform is highlighted in the Waveform display. If Early length is set to zero, then the Early setting have no effect on the audio. Otherwise, when changes are made to any control in the Early group, the IR waveform is recalculated and displayed in the Waveform display.

Length Adjusts the length of the Early reflections from zero to 500 ms. When set to zero, other controls in the Early group have no effect on the audio. The Early Length control adjusts the point in the impulse where the early portion ends and the late portion or tail begins.

For the most realistic reverb results, Early Length should be adjusted while viewing the waveform display. The early portion of a reverb IR is typically seen as a series of discrete spikes at the beginning of the waveform. Early Length can however be adjusted to any value to explore other creative possibilities.

Size Changes the size of the Early reflections, from 50% to 200%. Early Size expands or contracts the reflections in the early portion of the IR (as specified by the Early Length control). Reduce the Early Size to give the space a smaller, tighter sound. Increase the Early Size to give the space a larger, roomier sound.

Lo Cut Early Lo Cut controls the frequency of a highpass filter applied to the early portion of the IR (as specified by the Early Length control). The default setting of zero disables the highpass filter. As the control is set to a higher value, the corner frequency of the highpass filter is increased. Use this control to reduce boom and low frequency cancellations that can happen when mixing the reverb output with a dry signal.

Balance Early Balance controls the left/right gain balance of the early portion of the IR (as specified by the Early Length control). Adjust the Balance to control the apparent position of the reverb input in the stereo image. A negative value reduces the right channel gain. A positive value reduces the left channel gain.

⚠ *When loading an IR from an audio file, TL Space relies on the user to define which part of the IR is the early portion of the waveform. If the Early Length is set to zero, controls in the Early group will not affect the IR.*

Reverb

The Reverb group offers a low and high shelf EQ in addition to width and balance controls. The EQ operates prior to convolution processing.

Lo Freq Adjusts the frequency of a low frequency filter from 20 to 500 Hz.

Lo Gain Cuts or boosts the frequency set in Lo Freq from –15 dB to +15 dB.

Hi Freq Adjusts the frequency of a high frequency filter from 500 Hz to 20 kHz.

Hi Gain Cuts or boosts the frequency set in Hi Freq from –15 dB to +15 dB.

Width Increase or reduces the stereo spaciousness of the reverb. Use this control to tailor the reverb's character in a mix. Keep in mind that an IR that has little stereo separation to begin with may have limited results.

Balance Controls the balance of the reverb output. Use this control to balance a reverb from an IR that has been captured without a centered stereo image, or for creatively controlling the character of the reverb in a mix.

Reverse Reverses the IR waveform and controls the total length. As the IR waveform is recalculated, it is re-displayed in the Waveform display. The value shown is measured in Beats Per Minute to let you easily match the tempo of the music.

⚠ *If the waveform is reversed using the Reverse control, effected audio may continue to play for several seconds after the transport is stopped or audio input finishes.*

Decay

The Decay group controls allow the user to control the decay of the low, mid, and high frequency portions of the IR. Use the controls to tailor the reverb's character for a mix or for creative possibilities not found in traditional reverb processors.

Low Decreases or increases the rate at which low frequencies decay.

Low Xover Adjusts the frequency point that divides the IR into low and mid frequency portions.

Mid Decreases or increases the rate at which mid frequencies decay.

High Xover Adjusts the frequency point that divides the IR into mid and high frequency portions.

High Decreases or increases the rate at which high frequencies decay.

Front/Rear In quad and 5.0 channel output modes, Front and Rear independently control the decay for front and rear channels.

Info Screen

Click the Trillium Lane Labs logo to view the Info screen. The Info screen displays copyright and version information.

Using TL Space

This section addresses some common scenarios in which TL Space can be used during a Pro Tools session.

TL Space Plug-in Formats

TL Space is available in TDM, RTAS, and AudioSuite plug-in formats. Table 16 provides some general recommendations for use of TL Space based on the advantages and disadvantages of each plug-in format.

Using Presets

TL Space ships with a selection of factory presets for different reverb sounds. The presets are designed to give a sample of the various IRs available in the library in conjunction with various reverb settings. However, the presets do not cover the entire IR library.

Reverb Send

When TL Space is used on an Aux Input track as an effects send, the Dry control should be set to –inf dB.

Table 16. Pros and cons for different plug-in formats

Plug-in Format	Pros	Cons	Typical Use
TDM	Zero latency on HD Accel Minimal CPU load Very fast waveform manipulation	DSP Usage Max 3.4 second reverb tail Audio pause during snapshot switching	Mixing, live recording, post production
RTAS	Seamless Snapshot switching Very long reverb tails Available on Pro Tools LE	CPU load RTAS latency No surround support	Pro Tools LE users
AudioSuite	Low CPU load	Non-real-time No surround support	

Automating Snapshots

Snapshot automation is a powerful method of changing the reverb parameters without having to individually automate each parameter.

To automate TL Space Snapshots:

1 Insert TL Space on a track.

2 Select Snapshot mode.

3 Load an IR into each Snapshot and make any desired changes to specific TL Space controls.

4 Name each Snapshot as desired.

5 Click Auto.

6 Add Snapshot to the list of automated controls.

7 Select TL Space > Snapshot from the automation menu for the track.

8 Select the Pencil tool.

9 Draw the desired automation. The names displayed in the automation track will match the names entered for each Snapshot.

PCI Bus Contention

Large Pro Tools TDM systems running TL Space TDM in conjunction with video capture and playback or other PCI cards may encounter –6042 errors. These errors are caused when the Pro Tools DAE engine cannot transfer audio track data from the computer to the Pro Tools card over the PCI bus quickly enough. The error typically occurs when TL Space attempts to use the PCI bus to load impulses. PCI bus contention can be addressed with the following steps.

First, you may wish to locate more demanding PCI cards on the main PCI bus rather than in an expansion chassis. By locating the PCI cards away from Pro Tools DSP cards, PCI contention is typically reduced.

Secondly, assign more DSPs to the Pro Tools Playback Engine. Open the Playback Engine dialog and increase the number of DSPs per the Number of Voices.

If this does not resolve bus contention issues, the PCI Throttle control can be adjusted upwards one step at a time until the –6042 errors stop. For example, the default setting for a Macintosh G5 system is 33% and it can be increased in two steps to 100% until the bus contention is resolved. As more PCI throttling is used, TL Space will take longer to update the data on the DSP chip(s) running TL Space.

The PCI Throttle control can be adjusted in Preferences mode. This control offers the settings shown in Table 17. Settings take effect immediately across all instances of TL Space.

Table 17. PCI Throttle settings

Setting	Effect
Off	No PCI throttle control—maximum PCI contention
33%	Default setting for Macintosh G5 systems
66%	Default setting for Windows XP systems
100%	Maximum PCI throttle—minimum PCI contention

Increasing the PCI throttle control will reduce TL Space performance as PCI activity is reduced.

⚠ *For most users, the PCI throttle control provides optimum performance at the default setting and should not be adjusted.*

IR Library

TL Space includes an extensive impulse response library, divided into the following categories.

Table 18. IR Library Categories

Category	Description
Halls	Halls and auditoriums
Churches	Churches and chapels
Rooms	Large and small rooms
Chambers	Traditional studio reverb chambers
Plates	Classic electromechanical reverb plates
Springs	Classic electromechanical reverb springs
Digital Reverbs	Classic and contemporary digital reverb units
Post Production	Post production impulses
Tiny Spaces	Small reverbs from everyday objects
Pure Spaces	A selection of Pure Space impulses in multiple categories
Effects	Non-reverb effects for sound design in multiple categories
· Colors	Sound coloring and positioning
· Cosmic	Spacey smears and washes
· Impressions	Smears and washes that evoke an image
· Industrial	Heavy machinery
· Periodic table	Better living through chemistry

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